PRIAMUS®
A business of BARNES

PRODUCT OVERVIEW

PRIAMUS® Product Overview
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All dimensions are given in [mm].

Subject to technical amendments. Applicable are the technical specifications of data sheets and user manuals.

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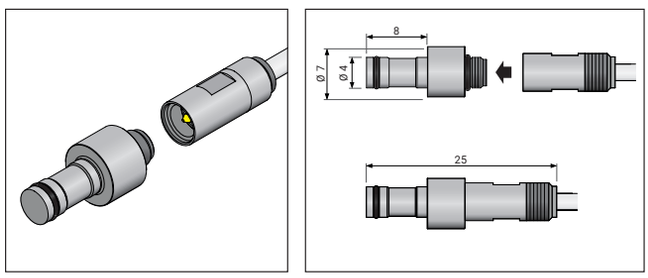
Introduction

Before you start with our new product overview, we would like to give you some general information about our products. In addition, we would like to briefly explain what we have adapted in the 2021 product overview in order to offer you even greater convenience.

New product table

We have completely revised our product tables for the 2021 product overview. All sensor characteristics, such as the nature of the sensor front, the scope of delivery or the accessories available for the sensor can now be found in a clearly arranged table to the right of the product pictures. With this new structure we want to provide you with a comfortable overview of all the features of our sensors, so that you do not lose track and thus reach your destination faster.



	6001Ax.x-102	6001Ax.x-102-H	6001Bx.x-102	6001Bx.x-102-H	6001Bx.x-102-W	6001Bx.x-102-H-W
With sensitivity detection PRIASED®			●	●	●	●
Sensor front machinable	●	●	●	●		
Sensor front non-machinable					●	●
Sensor front hardened		●		●		●
Scope of delivery:						
Connection cable type 1002D	●	●				
Connection cable type 1009B			●	●		
Connection cable type 1019A					●	●
Mounting nut type 6541A	●	●	●	●		
Mounting disc type 6550A					●	●
Mountig plate type 6581B	●	●	●	●	●	●
Identification plate	●	●	●	●	●	●

Example: Standard cavity pressure sensor type 6001Bx.x-102-H
Left: isometric representation and dimensional drawing, right: product table with sensor properties

Composition of our type numbers

At PRIAMUS every article has its own type number, which is also used as order number. The following table shows four examples of how our type numbers are composed. The elements that make up the type numbers are described in more detail below.

Type number	Basic number	Index	Cable length / length compact sensor / -	No. of channels / type of disconnect / -	Classification
5080A-16T	5080	A	-	16	T
1280A5	1280	A	5		
4004D2.0-101	4004	D	2.0	-	101
4005C100.25A1-H	4005	B	100.25	A1	-H

Basic number

The first digit of the basic number identifies the product group. The following product groups are distinguished:

1	Cables and accessories	7	Software and systems
4	Cavity temperature sensors and accessories	8	Electronics general
5	Amplifiers	9	Accessories for electronics
6	Cavity pressure sensors and accessories		

Index

With the index in the form of a capital letter we continuously mark the specific development status of our products in alphabetical order. Compatibility with the previous version is always guaranteed.

Exception:
For some cavity pressure sensors with two letters after the basic number, the first letter defines whether the sensor has PRIASED® sensitivity detection (A: without PRIASED® or B: with PRIASED®).
The second letter after the basic number defines the index.

Cable length / length of the compact sensor or separator [-]

Depending on the product group, this number element has different meanings:

For product group 1 (cables and accessories): cable length in metres [m], with decimal place if necessary.
For product group 4 and 6 (sensors): length of the compact sensors in millimetres [mm].
Separator: no meaning, serves for a better overview.

The following table shows an overview of all standard cable lengths:

Cable type	Standard lengths [m]
Connection cables for sensors	0.2 / 0.4 / 0.6 / 0.8 / 1.0 / 1.2
Connection and extension cables for sensors and amplifiers	2 / 5 / 10
Connection cables for BlueLine hybrid bus, amplifiers, BlueLine Core, I/O interface and control cabinet feed through	0.5 / 1 / 2 / 5 / 10

No. of channels / type of disconnect or separator

Depending on the product group, this number element has different meanings:

For product group 5 (amplifiers): number of channels.
For product group 4 and 6 (sensors): quick disconnect type (A, A1 or A2).
Separator: no meaning, serves for a better overview.

Classification

The classification may consist of several letters and numbers. The elements have the following meanings:

T	Cavity temperature	-W	Angled connectors
p	Cavity pressure	101	Electronics general
-H	Hardened sensor front	102	Accessories for electronics

Compatibility of our products - even with competitors‘ products!

We have deliberately designed our product range in such a way that our products can be combined with those of our competitors, which distinguishes us significantly from our competitors. In this way, we keep all options open for you so that you can gradually convince yourself of the quality of our products.

Scope of delivery

The scope of delivery always describes the total content of the delivery. For example, all sensors are always delivered with a mounting plate and an identification plate. Depending on the sensor type, additional components are added.

Accessories

Accessories are not part of the scope of delivery and must be ordered separately.

FILLCONTROL

THE MODULAR PROCESS MONITORING SYSTEM

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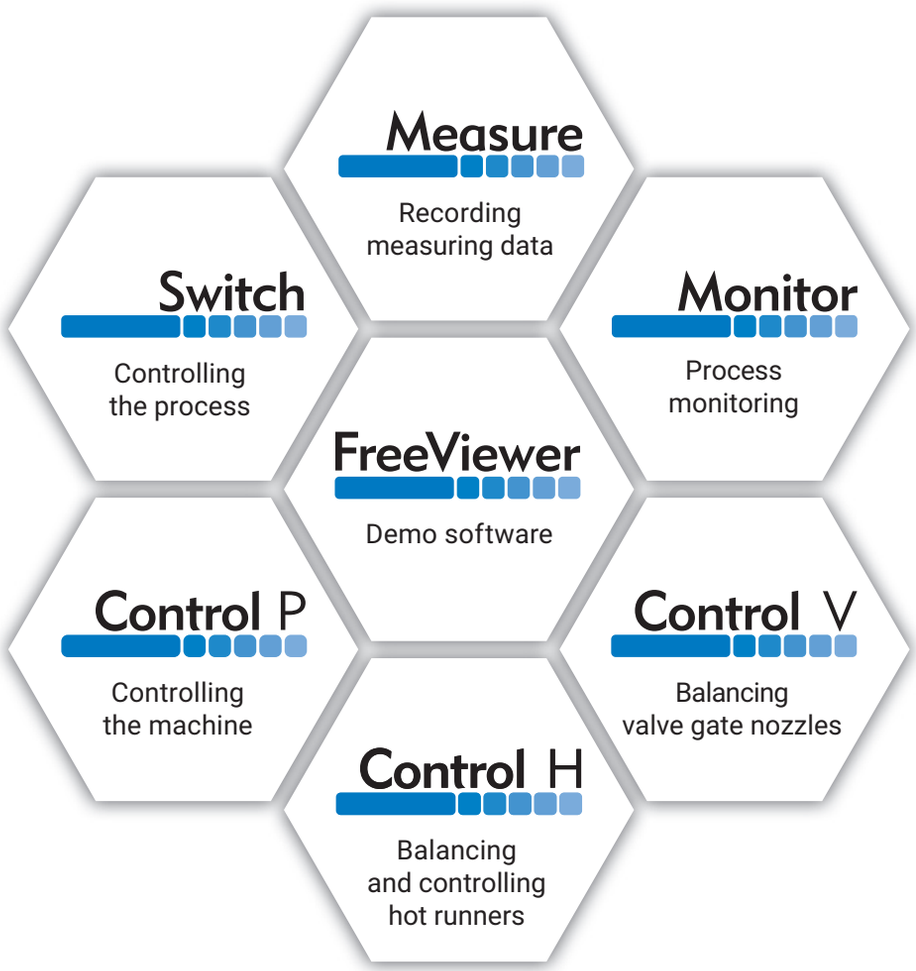
FILLCONTROL Mobile Monitoring System **Type 7090A-xpxT** 13

FILLCONTROL Software Architecture



Every injection molding process is different and requires its own tailor-made solution.

FILLCONTROL is the modular process monitoring system from PRIAMUS that can be flexibly adapted to individual customer requirements. Documenting, monitoring, open-loop or closed-loop process controlling – FILLCONTROL covers all applications with the appropriate module.

We create the data basis of FILLCONTROL by recording real process data within the mold. We are convinced that the data must be measured where the molding parts are actually produced – in the mold and not in the machine.

FreeViewer

FILLCONTROL FreeViewer is a free software module and enables the recorded data of all FILLCONTROL applications to be clearly displayed and analyzed.

In addition, all process monitoring, open-loop and closed-loop control functions can be displayed using previously recorded data or simulation data in a simulation mode.

FILLCONTROL FreeViewer is ideally suited as a management tool for the planning, optimization and analysis of production.

Application
Process visualization
Process analysis
Data analysis of all modules
Demo mode and simulation of all functions

Measure

FILLCONTROL Measure is a free software module with which measurement data such as cavity pressure, cavity temperature or voltage signals can be easily recorded and stored.

All that is needed is a combined connection cable both to power the amplifiers and to transfer data to the Windows PC/laptop and amplifiers.

Application
Data acquisition
Data storage
Process visualization
Process analysis

Monitor

FILLCONTROL Monitor is a comprehensive process monitoring module and serves as the basis for all PRIAMUS systems. It offers the possibility of simple bad part separation such as the removal of individual bad parts with the help of individual alarm signals.

In addition, FILLCONTROL Monitor offers the opportunity of detecting the melt position in the cavity, switching over to holding pressure automatically or via switching level and monitoring viscosities.

The quality-dependent monitoring parameters are divided into warning, intervention and alarm limits.

Application
Good / bad part separation
Switchover to holding pressure via switching level
Automatic switchover to holding pressure
Viscosity monitoring

Application	Example	Problem	Solution
General	Cable connector	Parts are not filled	Monitoring a pressure level
Coinjection	Food container	Uncontrolled filling	Monitoring a sheer rate
Family molds	Model kits	Different length of flow paths	Monitoring the individual cavities

Switch

FILLCONTROL Switch generates real-time switching signals on detection of the melt front and thus enables targeted open-loop process control depending on the flow process.

As soon as the melt in the cavity reaches the position of a cavity pressure sensor or a cavity temperature sensor, a switching signal is generated and used for appropriate switching operations depending on the application.

The switching signals can either be delayed or switched on and off depending on each other.

Application
Automatic sequential control
Valve gate nozzle control
Core pull control
Automatic venting
Rotary table applications
Automatic injection compressing molding

Application	Example	Problem	Solution
Overmolding of insert parts	Golf balls	Flow mark	Core pull control
Sequential molding	Bumper	Weld lines	Automatic valve gate nozzle control
Liquid silicon rubber (LSR)	Heart catheter	Unequal compression	

Control H

FILLCONTROL Control H is a module for the balancing of hot runner multi-cavity molds and fully automatic control of the melt flow in large-area components.

In this very effective process, the settings of the hot runner nozzles are permanently corrected depending on the respective melt flow in the cavity. This way, unfilled parts in multi-cavity molds are excluded and weld lines in large-area components are specifically controlled, moved and held in position.

This process is the prerequisite for a systematic reduction of cycle times for multiple molds.

Application
Hot runner balancing
Hot runner control

Application	Example	Problem	Solution
Multi-cavity molds	Infusion systems	Different filling grade	Automatic hot runner balancing
	Contact lenses	Cycle time too long	
Ceramics injection molding	HID lamps	Dimensional variations	

Control P

Due to material variations and different environmental conditions, bad parts are often produced with a constant machine setting.

FILLCONTROL Control P regulates the injection molding process fully automatically by permanently adjusting the machine parameters. This is the only way to ensure that molds can be transferred from one location to another.

In the end, the quality parameters such as compression, viscosity or the dimension of a molded part are directly controlled. A prerequisite for this is the separate measurement of the pressure and the temperature in the cavity.

Application
Automatic closed-loop process control

Application	Example	Problem	Solution
Processing of recycled materials	Tractor covers	Viscosity variations	Viscosity control
Precision injection molding	Blister packaging	Dimensional variations	Shrinkage control
Technical parts	Gear wheels	Insufficient strength	Compression control

Control V

FILLCONTROL Control V balances and controls the melt flow, especially in cold runner molds, by automatically delaying the opening times of the valve gate nozzles.

Similar to hot runner multi-cavity molds, this leads to all cavities being filled at the same time. This is particularly important for silicone and multi-component applications.

This way, unfilled parts in multi-cavity molds are excluded and weld lines in large-area components are specifically controlled, moved and held in position.

In general, it is possible to regulate the opening times of each valve gate nozzle individually, which is effectively used for family molds, for example. The nozzles are opened in real time by detecting the melt front in the cavity, so no host computer interface is required.

Application
Valve gate nozzle balancing
Valve gate nozzle control

Application	Example	Problem	Solution
Liquid silicon rubber (LSR)	Overmolded airbag igniters	Different compressions	Automatic balancing and control of valve gate nuzzles
Family molds	Food container	Different volume	
Thermoplastic (LSR)	Oxygen masks	Unsteady volume	

FILLCONTROL Mobile Monitoring System Type 7090A-xpxT

While a standard monitoring system is normally permanently installed on the injection molding machine, we offer a mobile solution for service, tests and laboratory applications with the monitoring system Type 7090A-xpxT.

All components required for monitoring, such as amplifiers and connection cables, can be stowed away in the robust transport case and are thus always “Ready to Measure“.

QFlow Systems Engineering

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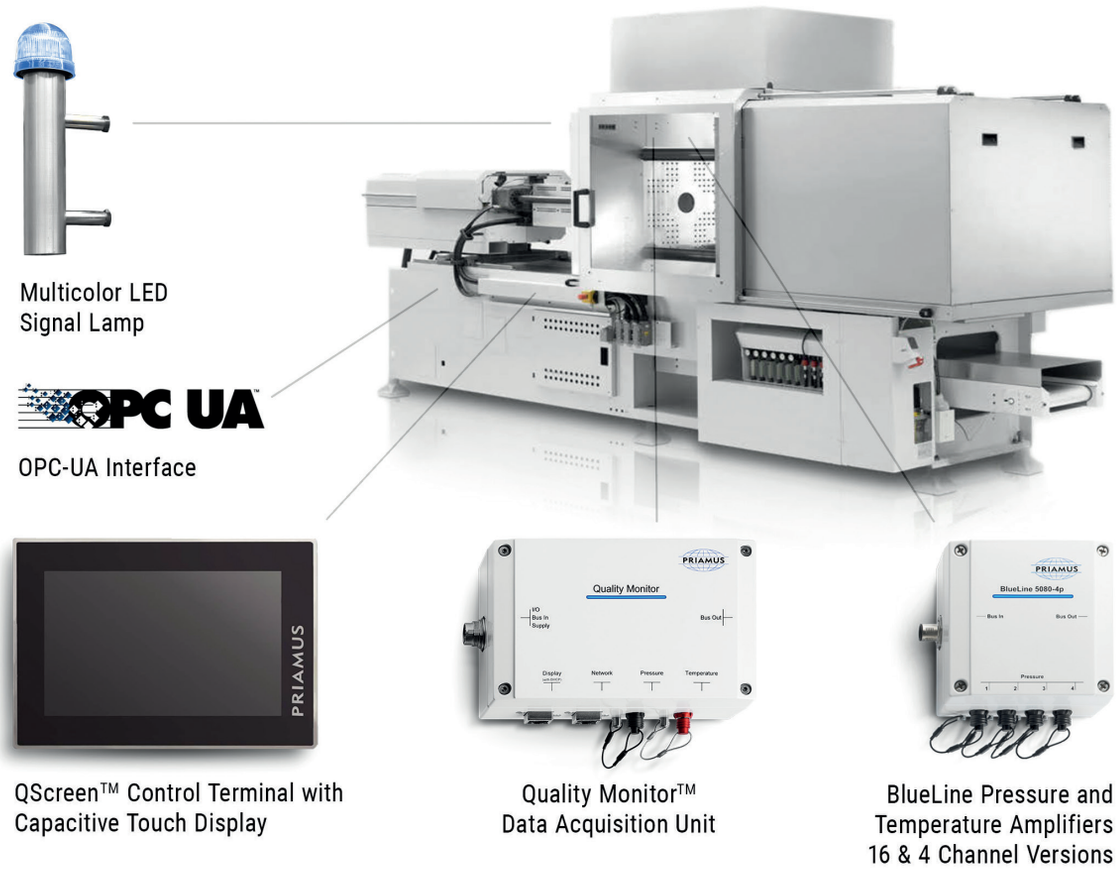
Quality Monitor™ - Digital Data Acquisition Unit Type 8081A 16

Multicolor LED Signal Lamp Type 9023A 17

Quality Monitor™ - The Overall System for Easy Process Monitoring



QScreen™ Control Terminal with Capacitive Touch Display

Quality Monitor™ Data Acquisition Unit

BlueLine Pressure and Temperature Amplifiers 16 & 4 Channel Versions

Quality Monitor™ is used for simple and reliable monitoring of the industrial injection molding process and is based on real process parameters. The basis for this is the process information obtained from the cavity pressure and cavity temperature sensors.

The central component of Quality Monitor™ is the digital data acquisition unit with integrated monitoring software, which can be operated without a PC. With the integrated OPC UA interface, Quality Monitor™ is the ideal IoT (Internet of Things) platform.

The system can be operated with any web browser-based screen. Ideally, the system is operated together with the QScreen™ control terminal and the multicolor LED signal lamp.

The system is compatible with all PRIAMUS BlueLine devices and can be supplemented with BlueLine amplifiers and machine interfaces depending on the application.

The Quality Monitor™ complete package with digital data acquisition unit, QScreen™ control terminal and LED signal lamp with magnetic holder is available under type number 7081A-QM.

Quality Monitor™ QScreen™ Control Terminal Type 8281A

The Quality Monitor™ QScreen™ control terminal has a 7-inch capacitive touchscreen and is used for web browser-based control of the digital data acquisition unit.

The control terminal is connected to the digital data acquisition unit via an Ethernet cable. The data transfer to a local server or a cloud takes place via the OPC UA protocol. User-specific information is stored and system updates are performed via the USB interface.

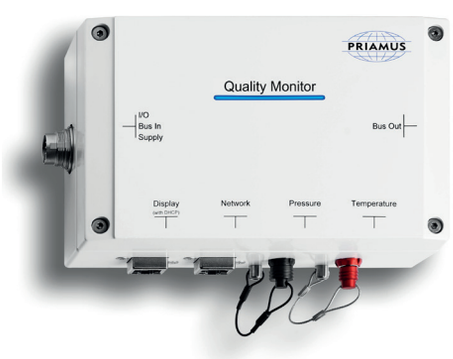
The VESA interface on the back of the housing is used to fix the operating terminal. In addition, magnetic disks are located on the back of the housing, which allow the QScreen™ control terminal to be positioned anywhere on the machine.

Quality Monitor™ Digital Data Acquisition Unit Type 8081A

The digital data acquisition unit is the central system component of Quality Monitor™.

The digital data acquisition unit is preferably controlled with the QScreen™ control terminal, but can also be controlled with other browser-compatible devices. The digital data acquisition unit receives and processes all input signals. Depending on the configuration, the processed signals are used for process monitoring and output signals can be controlled.

The data is located on a web interface and can also be output as PDF in a quality report if required.



Multicolor LED Signal Lamp Type 9023A

The multicolor LED signal lamp is directly controlled by the PRIAMUS systems and can be directly connected to the core type 8280C or the QScreen™ control terminal.

It is attached directly to the BlueLine Core with the mounting type 9024A or attached to a desired location on the machine with the magnetic mounting type 9025A.

The signal lamp is controlled as a serial interface via a USB connection and can display more than 200‘000 colors (RGB LEDs) and lighting effects.

BlueLine Hardware

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BlueLine Core Type 8280

The BlueLine Core is a powerful basic device for monitoring, open-loop and closed-loop process control of the injection molding process and serves as a platform for all FILLCONTROL software modules.

The BlueLine Core is equipped with a capacitive touch screen which can be easily operated even under production conditions.

The cleanroom-suitable device has a large number of digital interfaces via which all BlueLine devices are controlled.

A network connection is also possible via the Ethernet interface.

Connectors:

3 × USB
1 × Hybridbus-In
2 × Hybridbus Out
1 × RS-232
2 × Ethernet
1 × DVI-Out

BlueLine Amplifiers

Pressure and Temperature Amplifier Type 5070A-2p2T-VARAN

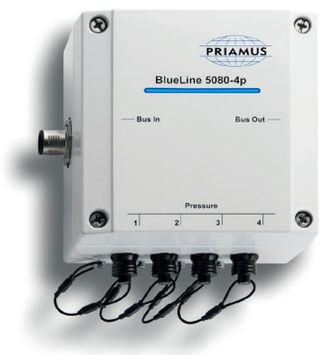
The pressure and temperature amplifier type 5070A-2p2T-VARAN processes two cavity pressure and two cavity temperature signals in a total of four channels.

Connectors:
2 × Fischer connector type 102 TRIAX,
2 × Fischer connector type 101 TRIAX

Cavity Pressure Amplifier Type 5080-4p

The BlueLine cavity pressure amplifier type 5080-4p processes cavity pressure signals on 4 channels.

Connectors: 4 × Fischer connector type 102 TRIAX



Cavity Pressure Amplifier Type 5080A-16p

The BlueLine cavity pressure amplifier type 5080A-16p processes 16 cavity pressure signals.

Connectors: 2 × Fischer connector type 104, 16-pin (Code 1)

Cavity Temperature Amplifier Type 5080A-4T

The BlueLine cavity temperature amplifier type 5080A-4T processes four cavity temperature signals.

Connectors: 4 × Fischer connector type 101 TRIAX

Cavity Temperature Amplifier Type 5080A-16T

The BlueLine cavity temperature amplifier type 5080A-16T processes 16 cavity temperature signals.

Connectors: 2 × Fischer connector type 104, 19-pin (Code 2)

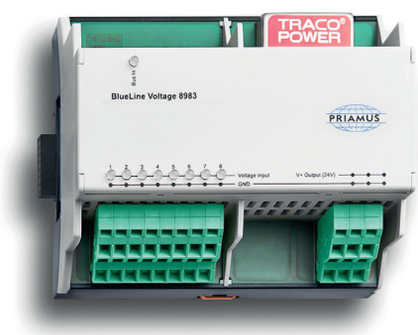
BlueLine Voltage Input Module Type 8983B

The BlueLine voltage input module is used for the simple recording of voltage signals as they are usually provided by injection molding machines.

These are usually setpoint and actual signals of the set machine parameters such as hydraulic pressure, screw position or injection speed.

The voltage signals are recorded in the FILLCONTROL software as analog signals and subsequently documented as quality parameters or used for control purposes.

The device is designed for installation in a control cabinet and is coupled to the I/O master via the „Bus In“ connection.



BlueLine Machine Interfaces

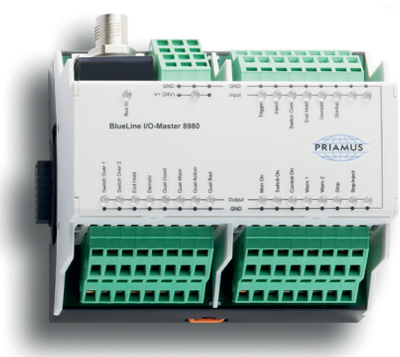
Important components of a measuring system are the interfaces. Our BlueLine interfaces I/O Master and I/O Expander are easily installed in the control cabinet and connected to the machine controller.

All control signals as well as all warning, intervention and alarm signals for reject separation are transmitted by the control system via a single hybrid bus cable. Our interfaces are modular and can be plugged together on a top-hat rail.

I/O Master Type 8980C

The I/O Master type 8980C is a basic module within the BlueLine system with digital inputs and outputs. Its main task is to transmit control signals between the injection molding machine and the BlueLine system.

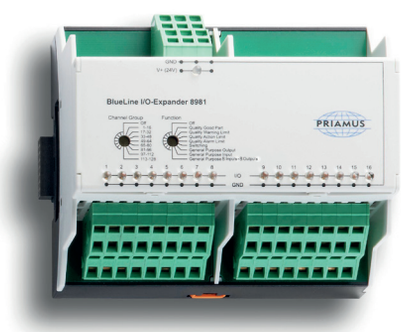
All outputs of the I/O Master are short-circuit and overvoltage-proof and also protected against reverse polarity. Thanks to the two-color LEDs, the status of the inputs and outputs can be checked at a glance at any time.



I/O Expander Type 8981A

The I/O Expander type 8981A is an expansion module within the BlueLine system with digital inputs and outputs. Its main task is to transmit control signals between the injection molding machine and the BlueLine system.

All outputs are short-circuit and overvoltage-proof and also protected against reverse polarity. Thanks to the two-color LEDs, the status of the inputs and outputs can be checked at a glance at any time.



Bus Interface Type 8982A

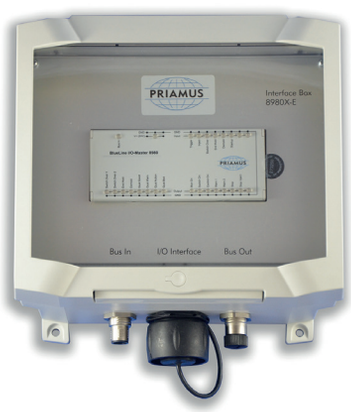
The BlueLine Bus Interface type 8982A is used to connect an I/O module series consisting of an I/O Master and one or more I/O Expanders. The modules are then connected to each other using a separately available hybrid bus cable.

I/O Master and I/O Expander modules are coupled directly, i. e. without cables, on a top hat rail bus. The bus interface is used to connect offset or more distant modules to the hybrid bus cable.

External Interface Types 8980C-E & 8981A-E

External interfaces are available for mounting the BlueLine I/O Master and I/O Expander outside the control cabinet.

A single I/O Master or I/O Expander is supplied in external housing with a plug connection. Thanks to the compact design, up to 16 switching signals can be processed.



External Interface Types 8984A & 8958A

The external interface types 8984A and 8985A are control cabinets with visible doors which have been equipped with BlueLine interfaces.

Type 8984A has a BlueLine I/O Master and can be optionally expanded with one to four BlueLine I/O Expanders. Up to a maximum of 64 switching signals (e.g. valve gate nozzles) can therefore be processed.

Type 8985A also has a BlueLine I/O Master but can be optionally expanded with one to six BlueLine I/O expanders. Up to a maximum of 96 switching signals (e.g. valve gate nozzles) can therefore be processed.

BlueLine Signal Tester

Trust is good - testing is better

In order to obtain error-free measurement results, all components of the BlueLine system must work together without errors at all times. To avoid unpleasant surprises, it is a good idea to check the components from time to time; the best way is to use the BlueLine signal tester type 8952A.

In addition to checking cavity pressure and cavity temperature signals, the BlueLine signal tester can also be used to check other potencial sources of errors such as sensor sensitivity or cable breakage. The preset programs can be selected via a display and are immediately ready for use.

The BlueLine signal tester is available as a single device or as a complete set in a case.

BlueLine Signal Tester Type 8952A

With the BlueLine signal tester, individual components within the Blue-Line system can be specifically checked.

The signal tester is powered by three 1.5V AA batteries and can be expanded with numerous accessories.

BlueLine Signal Tester Set Type 8911A

The BlueLine signal tester set includes the following components:

1 × 1 × signal tester type 8952A
3 × 1.5V AA batteries
1 × test pin type 6902B
1 × short circuit plug for temperature signals type 9017A
1 × short circuit plug for pressure signals type 9018A
1 × connection cable between signal tester and test pin type 1041A2
1 × case with foam inlet type 9022A

BlueLine Multi-Channel Connector Boxes

The thermoelectric voltages of the cavity temperature and charges of the cavity pressure measured in the mold are extremely small measured variables that are susceptible to faults, especially at high mold temperatures.

The quality of the measuring signals depends largely on the connection technology and a safe ground connection to the mold. For this reason, PRIAMUS only uses cable connections with more than one conductor.

Multi-channel connector boxes guarantee a secure ground connection to the mold and can be installed both on the mold surface and integrated into the mold. Depending on the requirements and position of the sensors, the multi-channel connector boxes are installed on the mold.

Multi-Channel Connector Box for Cavity Temperature Signals Type 1194A-8T

With a PRIAMUS multi-channel connector box type 1194A-8T, up to 8 temperature signals can be transmitted to a BlueLine amplifier via a connection cable.

The multi-channel connector box has the compact dimensions of 80 × 80 mm and is relatively light in weight.

Multi-channel connector boxes for cavity temperature signals are compatible with all PRIAMUS cavity temperature sensors.

Multi-Channel Connector Box for Cavity Pressure Signals Type 1195A-8p

With a PRIAMUS multi-channel connector box type 1195A-8p, up to 8 pressure signals can be transmitted to a BlueLine amplifier via a connection cable.

The multi-channel connector box has the compact dimensions of 80 × 80 mm and is relatively light in weight.

Multi-channel connector boxes for cavity pressure signals are compatible with all PRIAMUS cavity pressure sensors.

BlueLine Accessories

So that the components in the modular BlueLine system can work together as desired, various helpers are needed to pull the strings - or in our case the cables - in the background.

Type number	Description	Connector Side A	Connector Side B
1238Ax	Ethernet connection cable crossed (red) Bend radius: 35 mm	RJ-45	RJ-45
1280Ax	BlueLine hybridbus connection cable To connect all BlueLine devices Bend radius: 30 mm	M12 neg. 8-pin	M12 pos. 8-pin
1281Ax	Ethernet adapter cable To connect FILLCONTROL Measure Bend radius: 30 mm	M12 neg. 8-pin	M12 pos. 8-pin / RJ45
1282A	Control cabinet feed through for BlueLine hybridbus connection cable type 1280Ax Screw mounting with M16 thread	M12 neg. 8-pin	M12 pos. 8-pin
1282Ax	Installation kit, consists of: - Control cabinet feed through type 1282A - BlueLine hybridbus connection cable type 1280Ax Bend radius: 30 mm		
1283Ax	BlueLine hybridbus connection cable with angled connector to connect all BlueLine devices Bend radius: 30 mm	M12 pos. 8-pin	Angled connector M12 neg. 8-pin
1284Ax	Connection cable for power supply of BlueLine Core type 8280C directly on the machine Suitable for drag chains, Bend radius: 30 mm	M12 neg. 8-pin	Open cable ends
1290Ax	Connection cable for: - I/O Master in external box type 8980C-E - Engel injection molding machine Bend radius: 50 mm	Circular connector neg. 32-pin	Harting pos. 24-pin
1291Ax	Connection cable for: - I/O Master in external box type 8980C-E - Arburg injection molding machine Bend radius: 25 mm	Circular connector neg. 32-pin	D-Sub pos. 15-pin
1292Ax	Connection cable for: - I/O Expander in external box type 8981A-E - Engel injection molding machine Bend radius: 45 mm	Circular connector neg. 19-pin	Harting pos. 24-pin

Type number	Description	Connector Side A	Connector Side B
1293Ax	Connection cable for: - I/O Expander in external box type 8981A-E - Arburg injection molding machine Bend radius: 25 mm	Circular connector neg. 19-pin 	D-Sub pos. 15-pin
1294Ax-openwire	Connection cable with open cable ends for: - QM data acquisition unit type 8081A-QM	Circular connector M16 neg. 12-pin 	Open cable ends
1294Ax-Arbg-1	Connection cable for: - QM data acquisition unit type 8081A-QM - Arburg injection molding machine	Circular connector M16 neg. 12-pin 	D-Sub pos. 15-pin
1294Ax-Engel-1	Connection cable for: - QM data acquisition unit type 8081A-QM - Engel injection molding machine	Circular connector M16 neg. 12-pin 	Harting pos. 24-pin
1294Ax-Varan-1	Connection cable for: - QM data acquisition unit type 8081A-QM - BlueLine power supply unit type 9016A	Circular connector M16 neg. 12-pin 	Circular connector M12 pos. 8-pin
1314A	Label set for BlueLine systems Various signs and labels for system-related labeling of sensor channels, BlueLine devices and cables		
9005B	Power supply unit for installing in the control cabinet		
9015A	Inductive switch for BlueLine devices for simple starting and measuring Bend radius: 7 mm	Proximity switch 	M12 pos. 8-pin
9016A	Power supply unit for feeding of: - BlueLine amplifier type 5080A - BlueLine Core type 8280C Bend radius: 7 mm	M12 neg. 8-pin 	Power connector
9080A	Top-hat rail set For mounting of BlueLine devices		

Sensors

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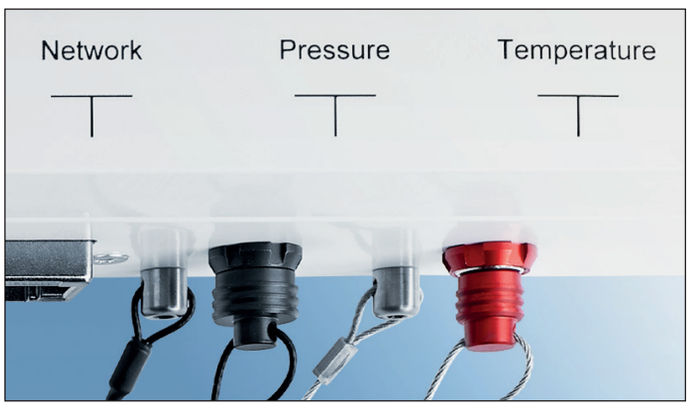
Things to Know About our Sensors

Sensors are basically there to record the most important process parameters and to forward them to a system for evaluation in the simplest possible way, “Plug & Measure“ so to speak. However, not all sensors are the same: depending on the technology and technical requirements, certain basic conditions must be met. This is why PRIAMUS sensors are unique. Their design, reaction speed and the connection technology used have been optimized for the injection molding process.

We Show our Colors

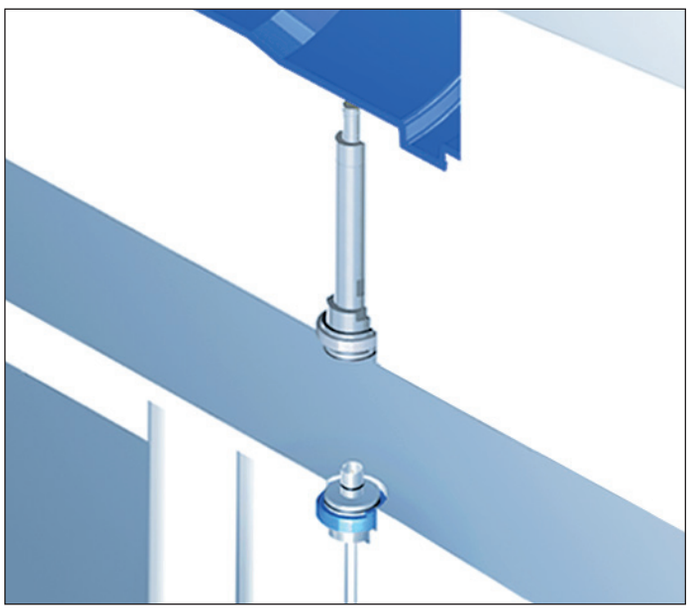


With us you can bet everything on red or everything on black with a clear conscience - in the end you win!

To avoid confusion between cavity pressure and cavity temperature sensors, we use a consistent color concept: red for cavity temperature sensors and black for cavity pressure sensors. This color distribution applies to all plugs of connection and extension cables of the corresponding sensors.

In addition to this color differentiation, our plugs also have different connections and diameters to avoid confusion.

Compact Sensors



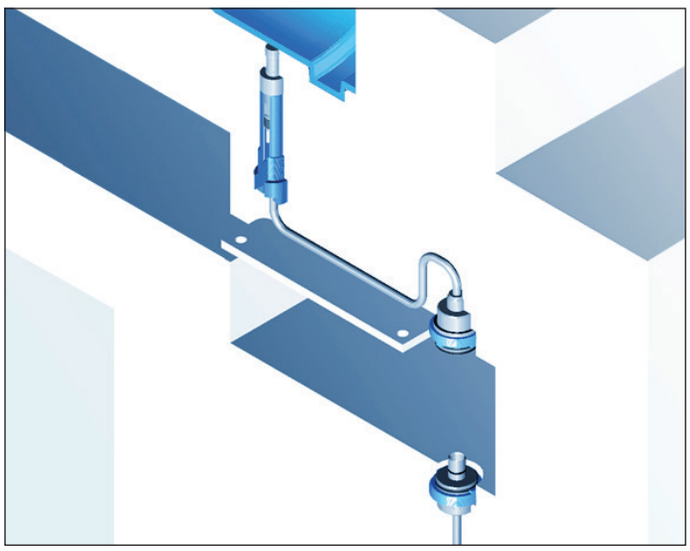
Tight installation conditions? Not for this sensor!

PRIAMUS compact sensors are used to measure both the cavity pressure and the cavity temperature. As the name suggests, they are compact. The rigid sensor housing is installed axially in the cavity inserts of multi-cavity molds without connection cable. The measuring signals are then transmitted via a quick disconnect. The length of the sensor housing is variable and can also be somewhat longer if the installation conditions are not quite so tight.

Compact sensors are easy-to-handle and inexpensive to maintain. They are used in many cavities and wherever installation conditions are tight.

Another advantage is easy cleaning: put on the protective cap and put it into the ultrasonic bath.

Flexible Quick Disconnects



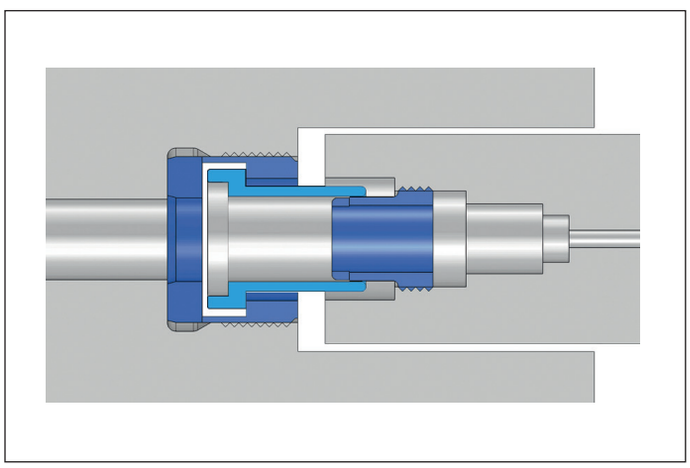
Flexible quick disconnects are available for measuring cavity pressure and cavity temperature. Thanks to a simple plug-in connection, flexible quick disconnects can be easily installed and removed while the sensors remain in the mold. This makes it easier to manufacture and maintain the cavities.

Compared to compact sensors, our flexible quick disconnects are equipped with a connection cable which is - as the name suggests - flexible. Thanks to this flexible cable connection, sensor and quick disconnect can be placed in different positions. Compared to a sensor that is installed in the mold platen itself, the sensor position can be chosen flexibly. The size of the mold insert is not important.

Floating Quick Disconnects and Compact Sensors

Times change - so do the installation tolerances of mold inserts!

Mold inserts are often installed in the floating manner to allow standardization when replacing a defective mold insert. This means that they are no longer fitted exactly into the mold platen, but are provided with a generous tolerance. This is also referred to as “floating mold inserts“.



For this installation situation, we have developed a new type of quick disconnect system that automatically compensates for the lateral displacement of the mold inserts. This is made possible by the fact that the two quick disconnect plugs “find“ each other automatically during installation, which would inevitably lead to a collision in the case of a rigid disconnect concept.

Floating quick disconnects simplify the exchange of mold inserts because the quality criteria for the mold engineers are much lower. This is a prerequisite for the standardization of molding components, especially in a global environment.

Floating quick disconnects are available for both cavity pressure and cavity temperature sensors.

Machinable & Hardened Sensor Fronts

Long live the hardened sensor front! Our sensors are available with hardened or machinable sensor fronts. But which one fits best?

Machinable sensor front

All PRIAMUS cavity pressure sensors as well as some cavity temperature sensors can be machined at the sensor front and thus adapted to the cavity contour. They are suitable for processing most standard plastics, but wear out faster with highly abrasive plastics.

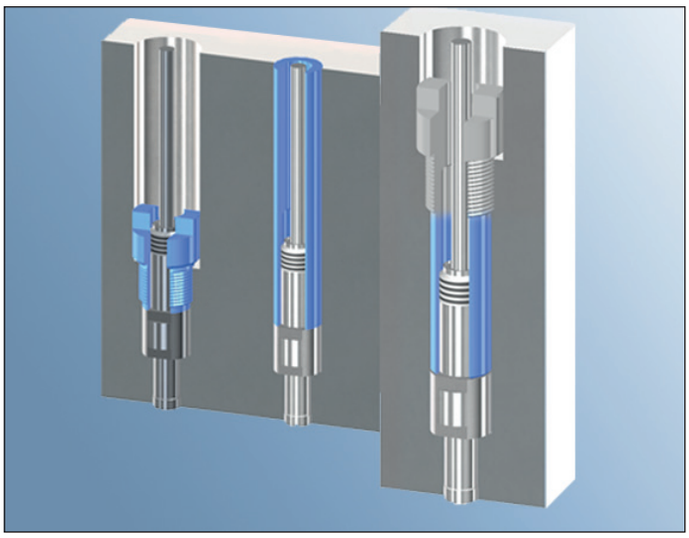
Hardened sensor front

For aggressive and abrasive plastics such as ceramic melts or melts with a high filler content, sensors with a hardened sensor front are the first choice. Hardened sensor fronts are more resistant and thus significantly extend the life span of the sensors.

The picture shows impressions of sensor fronts after about 300,000 cycles with abrasive plastics: the machinable sensor front 015 has already been significantly worn down compared to the hardened sensor front 014.

PRIAFIT® Mounting Sleeves

Is the installation of pressure and temperature sensors in the mold something that has to be learned? No, thanks to our PRIAFIT® mounting sleeves it doesn't.



Compared to the conventional installation variants with mounting nut or distance sleeve, PRIAFIT® mounting sleeves score points with the following advantages:

- The length of the mounting sleeve can be within a certain tolerance range during installation. This simplifies the requirements for the mold engineer.
- With PRIAFIT® mounting sleeves, nipple threads that have to be manufactured deep in the bore are a thing of the past.

Sensor installation is simplified, less time-consuming and ultimately - and this is the decisive factor from the customer's point of view - cheaper.

Cavity Pressure Sensors

With PRIAMUS cavity pressure sensors the properties of an injection molding part are already monitored during production and adjusted if necessary.

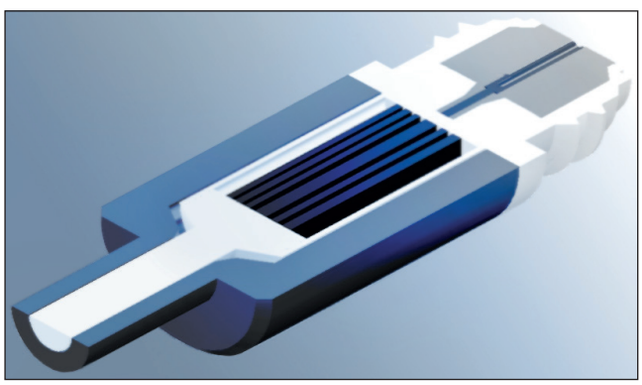
Cavity pressure sensors are active sensors, which means that neither power supply nor electronics are installed in their housing. This makes the sensor a real flyweight. Yet thanks to the right technology, they can easily withstand the high temperatures in the injection mold despite their small size and weight.

PRIAMUS cavity pressure sensors have separable connection cables that can be easily exchanged. In addition to angled connectors, some sensors have hardened or machinable sensor fronts. Most sensors are equipped with PRIASED® sensitivity detection or PRIASAFE™ protective cover.

PRIASED® Automatic Sensitivity Detection

Plug & Measure - PRIASED® makes working with cavity pressure sensors child's play.

PRIASED® is a system for automatic sensitivity detection for cavity pressure sensors. Measurement data on sensor sensitivity are stored on a hardware code, which is permanently installed in the sensor housing.



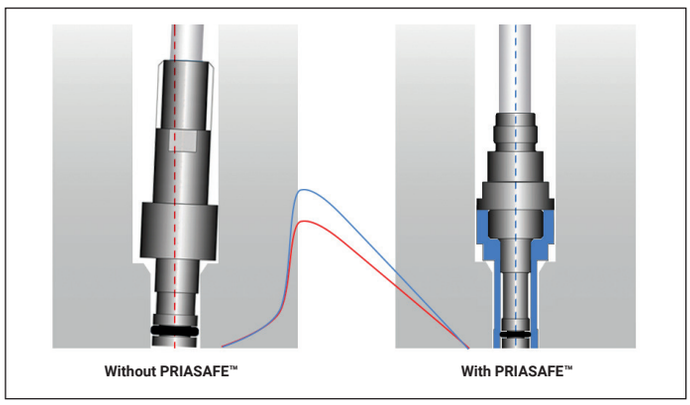
PRIASED® offers the following advantages:

- **Plug and Measure**
  Automatic assignment of the correct settings: the user does not need to worry about the correct sensitivity values of the sensors.
- **Error reduction**
  Due to the automatic assignment there is no mix-up.
- **Robust and temperature resistant**
  The hardware code can withstand high temperatures.

In recent years, the concept of automatic sensitivity detection has become widely accepted in process monitoring and closed-loop process control. Automation as required in the „IoT" (Internet of Things) environment is hardly conceivable from today's point of view with manual settings.

PRIASAFE™ Installation-safe Sensor with Protective Cover

Even the best sensor can be used in the wrong way!



Cavity pressure sensors are highly sensitive measuring instruments that deliver very precise results. The sensitive part of the sensor must stand freely in the bore and may not touch the bore wall. If this happens anyway, the sensor sensitivity is reduced due to the so-called "force shunt" and the measurement results are therefore incorrect.

PRIASAFE™ is a concept in which the sensor is surrounded by a protective cover. This protects the sensor from negative force effects due to incorrect installation and thus ensures correct measurement results.

Angled Connectors

Simple but effective!

Tight installation conditions? With our angled connectors you can save space where there is none.

Small sensors are required for tight installation conditions. Often, however, it is not the size of the sensor that causes the mold engineering headaches, but the question of where to place the connection cable.

Our answer: angled connectors!

Many of our cavity pressure sensors are available with angled connectors to lead the connection cable laterally outwards. Sensor modifications? Not necessary, because the connection cable can be separated from the sensor and thus be replaced at any time.

Standard and Miniature Cavity Pressure Sensors

Cavity pressure sensors are the standard for industrial monitoring and control of the injection molding process. For decades, sensors of this type have been used to determine the physical properties of an injection molding part during production and - if necessary - to adjust them accordingly.

Over the years, piezoelectric measurement technology has established itself for this application, as the sensor itself is ideal for this purpose. Due to the sometimes very fast injection processes, requirements arise that can only be met by very compact and rigid sensor constructions. The reason is the high natural frequency of the sensor, which results from this.

The piezoelectric sensor is an active sensor, i.e. no power supply and no electronics are required in the sensor. This makes it suitable for high temperatures, as they are sometimes found in injection molds, even if the size is small.

Technical Data

Properties	Specification	
Maximum melt temperature (plastics) in the cavity	No limitation	
Maximum mold temperature	0 ... 200 °C / 32 ... 392 °F	
Sensitivity	Types 6001A / 6001B	10 pc / bar
	Types 6002B	5 pC / bar
	Types 6003A / 6003B	5 pC / bar
	All miniature cavity pressure sensors	2 pC / bar
Measuring range	0 ... 2000 bar / 0 ... 29008 psi / 0 ... 200 MPa	
Overload	2500 bar / 36260 psi / 250 MPa	
Linearity deviation	< ±1 %	

Marking Example

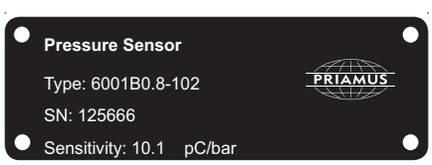
The type number consists of the following elements:

A general overview of number identification can be found in the introduction on page 6 and 7.

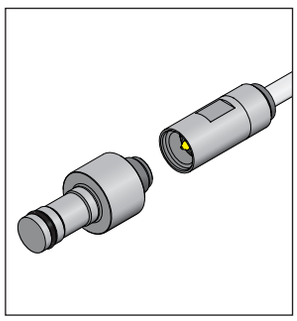
	6001Bx.x-102-H-W
6001	Sensor type
B	Index
x.x	Cable length (in m)
102	Fischer connector type
H	Hardened sensor front
W	Angled connector

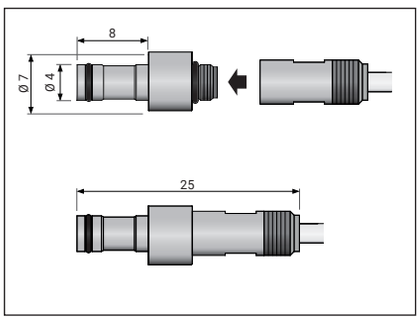
Identification Plate

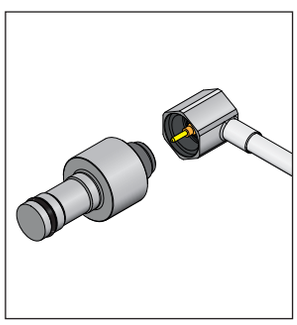
All cavity pressure sensors are tested and provided with a serial number. Thus all test results are traceable and all sensors are traceable. This data is located on the identification plate, which can be attached to the machine.

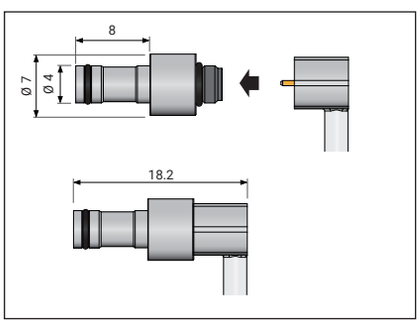


Standard Cavity Pressure Sensors Type 6001



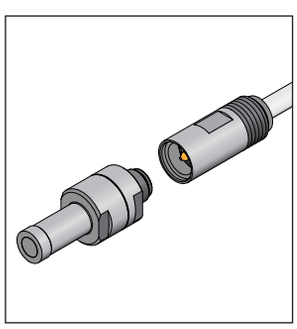


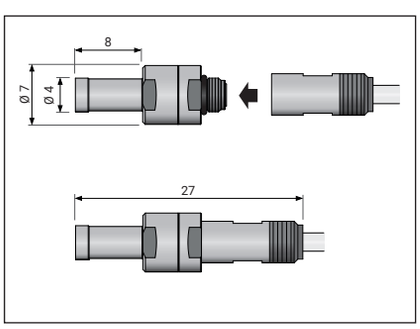


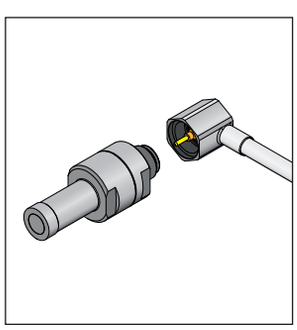


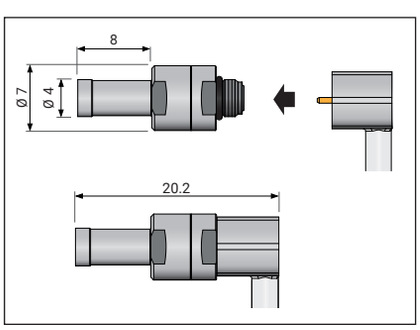
	6001Ax.x-102	6001Ax.x-102-H	6001Bx.x-102	6001Bx.x-102-H	6001Bx.x-102-W	6001Bx.x-102-H-W
With sensitivity detection PRIASED®			●	●	●	●
Sensor front:						
Machinable	●	●	●	●		
Non-machinable					●	●
Hardened		●		●		●
Scope of delivery:						
Connection cable type 1002D	●	●				
Connection cable type 1009B			●	●		
Connection cable type 1019A					●	●
Mounting nut type 6541A	●	●	●	●		
Mounting disc type 6550A					●	●
Mountig plate type 6581B	●	●	●	●	●	●
Identification plate	●	●	●	●	●	●
Cables:						
Connection cable types 1041A / 1049B	●	●	●	●	●	●
Multi-pin connection cable types 1045B / 1047A / 1054B	●	●	●	●	●	●
Extension cable type 1043B	●	●	●	●	●	●
Accessories:						
Distance sleeve type 6522A	●	●	●	●		
Mounting / extracting tool for sensor type 6561B	●	●	●	●		
PRIAFIT® mounting sleeve type 6530A	●	●	●	●		
Assembly tool for mounting nut and mounting sleeve 6562B	●	●	●	●		
Assembly tool for sensor and mounting disc, consists of: torque wrench type 1320A and bit set type 1321A					●	●
Multi-channel connector box type 1195A-8p	●	●	●	●	●	●
Dummy type 6501A	●	●	●	●		
Dummy type 6501A-W					●	●

Standard Cavity Pressure Sensors Type 6002



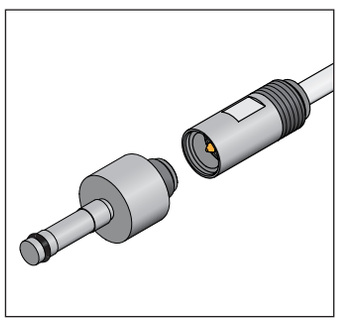


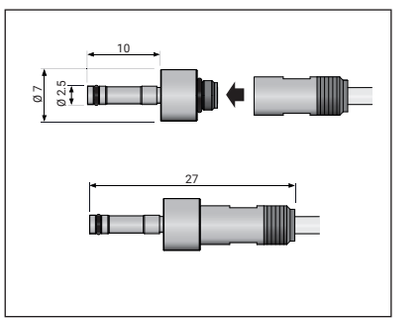


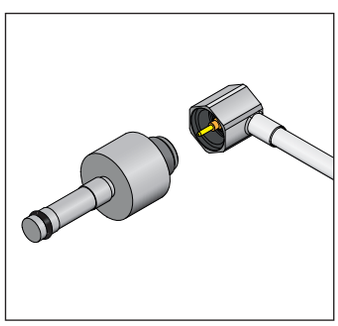


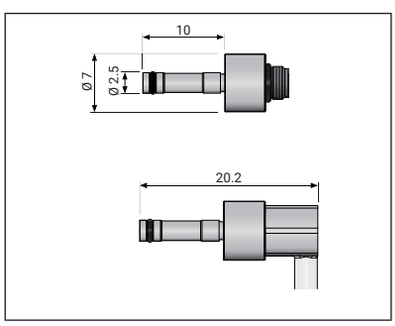
	6002Bx.x-102	6002Bx.x-102-H	6002Bx.x-102-W	6002Bx.x-102-H-W
With sensitivity detection PRIASED®	●	●	●	●
With PRIASAFE™	●	●	●	●
Sensor front:				
Machinable	●	●		
Non-machinable			●	●
Hardened		●		●
Scope of delivery:				
Connection cable type 1009B	●	●		
Connection cable type 1019A			●	●
Mounting nut type 6541A	●	●		
Mounting disc type 6550A			●	●
Mounting plate type 6581B	●	●	●	●
Identification plate	●	●	●	●
Cables:				
Connection cable types 1041A / 1049B	●	●	●	●
Multi-pin connection cable types 1045B / 1047A / 1054B	●	●	●	●
Extension cable type 1043B	●	●	●	●
Accessories:				
Distance sleeve type 6522A	●	●		
Mounting / extracting tool for sensor type 6561B	●	●		
Assembly tool for sensor and mounting disc, consists of: torque wrench type 1320A and bit set type 1321A			●	●
PRIAFIT® mounting sleeve type 6530A	●	●		
Assembly tool for mounting nut and mounting sleeve type 6562B	●	●		
Multi-channel connector box type 1195A-8p	●	●	●	●
Dummy type 6502A	●	●		
Dummy type 6502A-W			●	●

Standard Cavity Pressure Sensors Type 6003



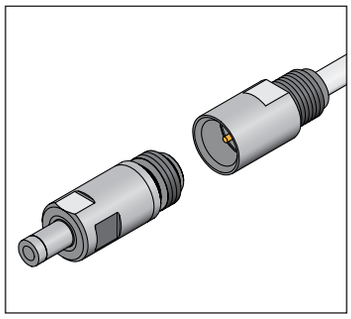


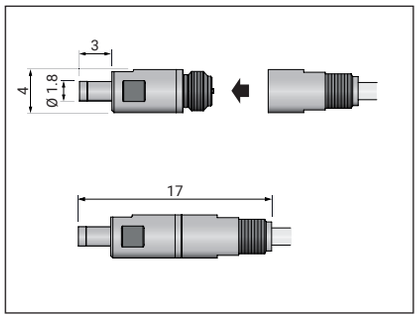


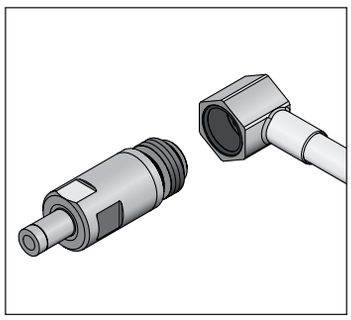


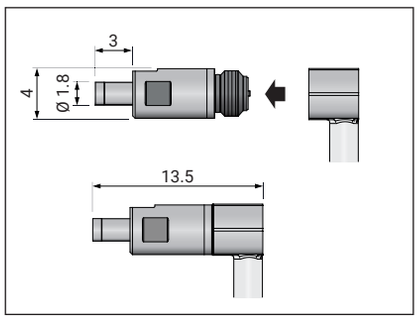
	6003Ax.x-102	6003Ax.x-102-H	6003Bx.x-102	6003Bx.x-102-H	6003Bx.x-102-W	6003Bx.x-102-H-W
With sensitivity detection PRIASED®			●	●	●	●
Sensor front:						
Sensor front machinable	●	●	●	●		
Sensor front non-machinable					●	●
Sensor front hardened		●		●		●
Scope of delivery:						
Connection cable type 1002D	●	●				
Connection cable type 1009B			●	●		
Connection cable type 1019A					●	●
Mounting nut type 6541A	●	●	●	●		
Mounting disc type 6550A					●	●
Mounting plate type 6581B	●	●	●	●	●	●
Identification plate	●	●	●	●	●	●
Cables:						
Connection cable types 1041A / 1049B	●	●	●	●	●	●
Multi-pin connection cable types 1045B / 1047A / 1054B	●	●	●	●	●	●
Extension cable type 1043B	●	●	●	●	●	●
Accessories:						
Distance sleeve type 6522A	●	●	●	●		
Mounting / extracting tool for sensor type 6561B	●	●	●	●		
PRIAFIT® mounting sleeve type 6530A	●	●	●	●		
Assembly tool for mounting nut and mounting sleeve 6562B	●	●	●	●		
Assembly tool for sensor and mounting disc, consists of: torque wrench type 1320A and bit set type 1321A					●	●
Multi-channel connector box type 1195A-8p	●	●	●	●	●	●
Dummy type 6503A	●	●	●	●		
Dummy type 6503A-W					●	●

Miniature Cavity Pressure Sensors Type 6006BC



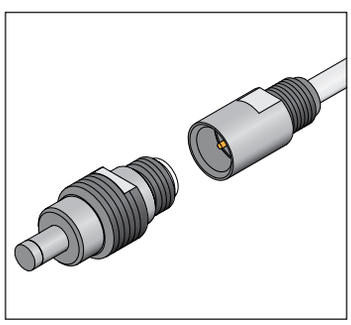


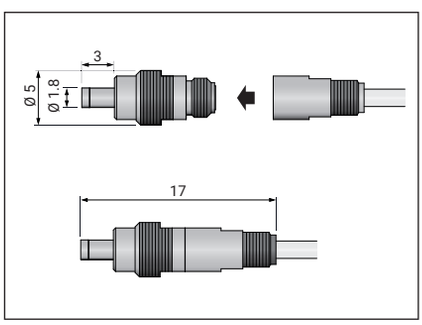


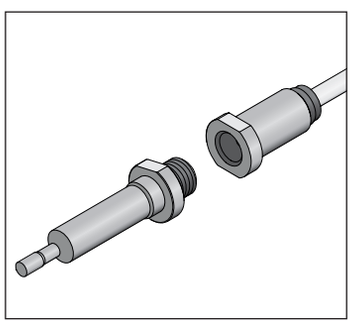


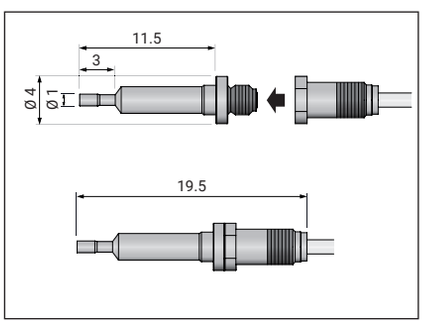
	6006BCx.x-102	6006BCx.x-102-W
With sensitivity detection PRIASED®	•	•
With PRIASAFE™	•	•
Sensor front:		
Machinable	•	
Non-machinable		•
Scope of delivery:		
Connection cable type 1010C	•	
Connection cable type 1020A		•
Mounting nut type 6544B	•	
Mounting disc type 6551A		•
Mounting plate type 6581B	•	•
Identification plate	•	•
Cables:		
Connection cable types 1041A / 1049B	•	•
Multi-pin connection cable types 1045B / 1047A / 1054B	•	•
Extension cable type 1043B	•	•
Accessories:		
Distance sleeve type 6523B	•	
Mounting / extracting tool for sensor type 6569A	•	
PRIAFIT® mounting sleeve type 6531A	•	
Assembly tool for mounting nut and mounting sleeve type 6567C	•	
Assembly tool for sensor and mounting disc, consists of: torque wrench type 1320A and bit set type 1321A		•
Multi-channel connector box type 1195A-8p	•	•
Dummy type 6512A	•	
Dummy type 6512A-W		•

Miniature Cavity Pressure Sensors Types 6007BC / 6008AA



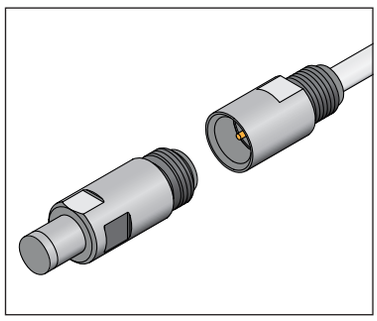


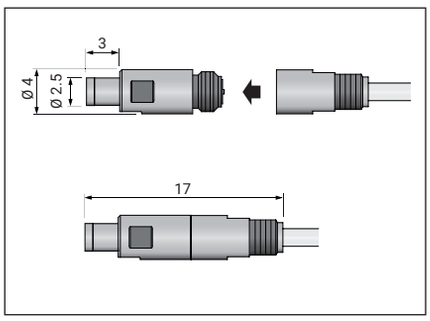


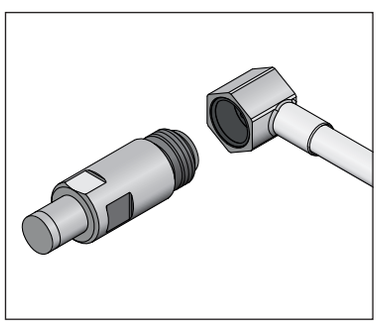


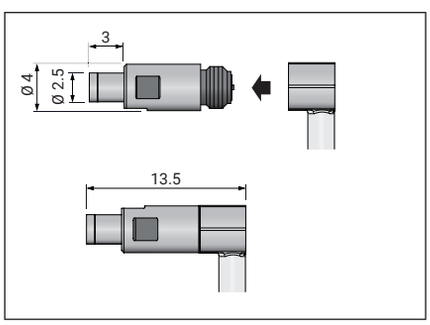
	6007BCx.x-102	6008AAx.x-102
With sensitivity detection PRIASED®	•	
With PRIASAFE™	•	
Sensor front:		
Machinable		•
Non-machinable	•	
Scope of delivery:		
Connection cable type 1010C	•	
Connection cable type 1011A		•
Mounting nut type 6544B		•
Mounting plate type 6581B	•	•
Identification plate	•	•
Cables:		
Connection cable types 1041A / 1049B	•	•
Multi-pin connection cable types 1045B / 1047A / 1054B	•	•
Extension cable type 1043B	•	•
Accessories:		
Distance sleeve type 6523B		•
Mounting / extracting tool for sensor type 6568A		•
Mounting / extracting tool for sensor type 6569A	•	
Assembling aid type 6585A		•
PRIAFIT® mounting sleeve type 6531A		•
Assembling tool to tighten the sensor type 6570A	•	
Assembling tool for mounting nut and mounting sleeve 6567C		•
Multi-channel connector box type 1195A-8p	•	•
Dummy type 6513A	•	
Dummy type 6508A		•

Miniature Cavity Pressure Sensors Type 6010BC









	6010BCx.x-102	6010BCx.x-102-W
With sensitivity detection PRIASED®	●	●
With PRIASAFE™	●	●
Sensor front:		
Machinable	●	
Non-machinable		●
Scope of delivery:		
Connection cable type 1010C	●	
Connection cable type 1020A		●
Mounting nut type 6544B	●	
Mounting disc type 6551A		●
Mounting plate type 6581B	●	●
Identification plate	●	●
Cables:		
Connection cable types 1041A / 1049B	●	●
Multi-pin connection cable types 1045B / 1047A / 1054B	●	●
Extension cable type 1043B	●	●
Accessories:		
Distance sleeve type 6523B	●	
Mounting / extracting tool for sensor type 6569A	●	
PRIAFIT® mounting sleeve type 6531A	●	
Assembling tool for mounting nut and mounting sleeve 6567C	●	
Assembly tool for sensor and mounting disc, consists of: torque wrench type 1320A and bit set type 1321A		●
Multi-channel connector box type 1195A-8p	●	●
Dummy type 6514A	●	
Dummy type 6514A-W		●

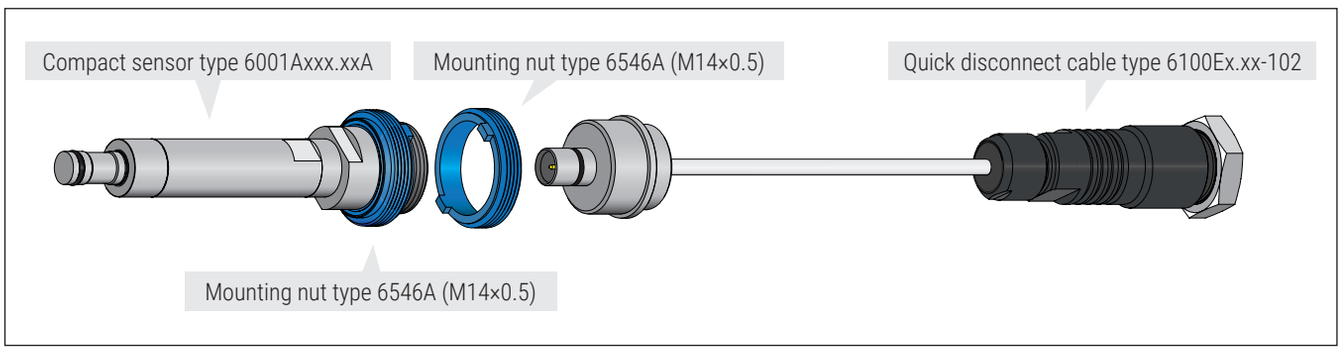
Cavity Pressure Compact Sensors

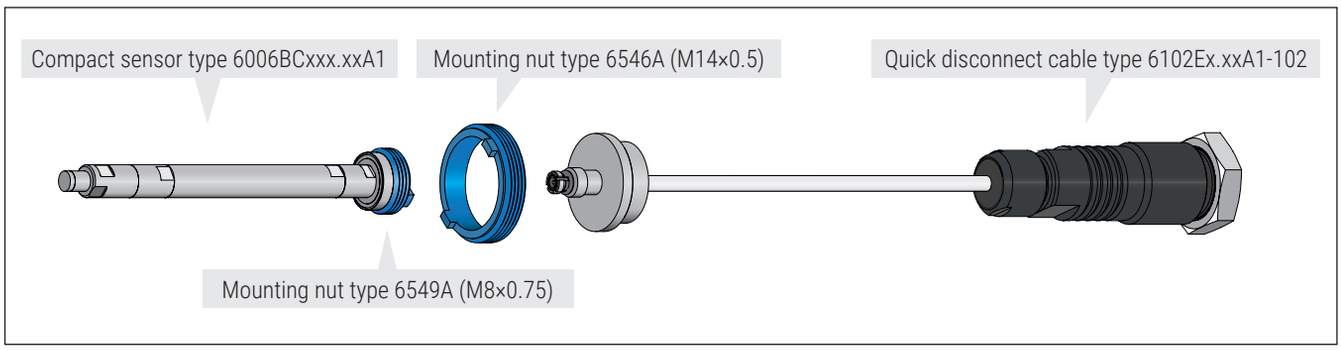
Many injection molding parts are not produced directly in the mold platen, but with the aid of mold inserts. This facilitates the production of the cavities and the handling during maintenance. However, the use of cavity pressure and cavity temperature sensors is often limited by space constraints. In addition, handling the connection cables of permanently installed sensors is often laborious when installing and removing the mold inserts.

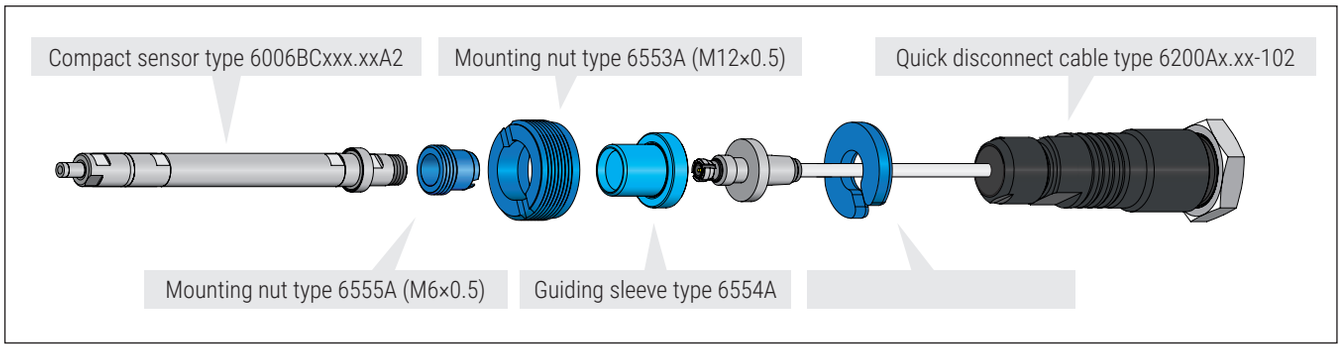
So-called compact sensors for pressure and temperature measurement in the injection mold were developed as the preferred solution and as an alternative to flexible quick disconnects with cables. Instead of connecting the sensors inside the mold insert to the disconnect via a connection cable, the compact sensor is fixed to the disconnect via a distance sleeve. This results in an extremely compact and very easy-to-handle solution, which is available in different sizes depending on the application and space requirements.

The length of the compact sensors is variable within given tolerances and must be specified when ordering. The disconnect counterpart in the mold plate is connected to the connector plug via an integrated cable.

The following examples show measuring chains with cavity pressure compact sensors with the corresponding quick disconnect cable of the three quick disconnect types A, A1 and A2.

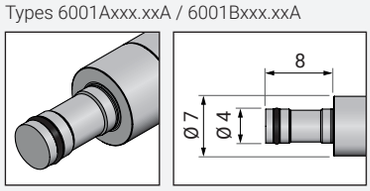




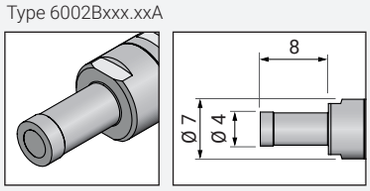


Cavity Pressure Compact Sensors with Quick Disconnect Type A

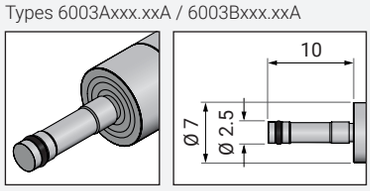
Types 6001Axxx.xxA / 6001Bxxx.xxA



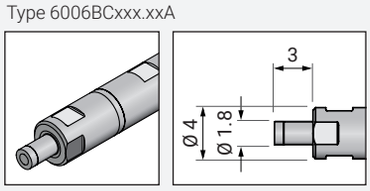
Type 6002Bxxx.xxA



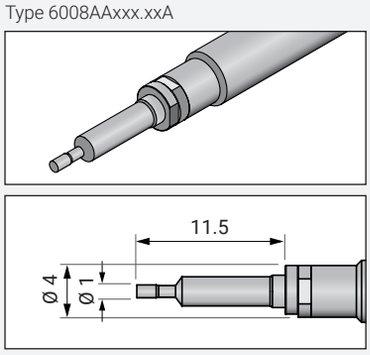
Types 6003Axxx.xxA / 6003Bxxx.xxA



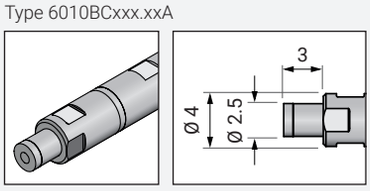
Type 6006BCxxx.xxA



Type 6008AAxxx.xxA



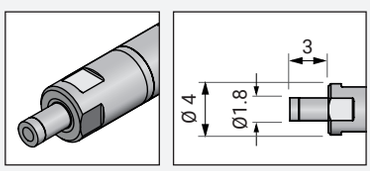
Type 6010BCxxx.xxA



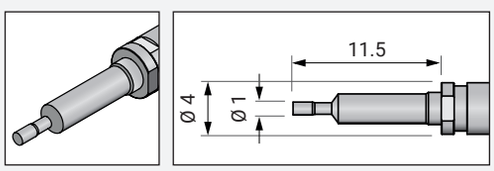
	6001Axxx.xxA	6001Bxxx.xxA	6002Bxxx.xxA	6003Axxx.xxA	6003Bxxx.xxA	6006BCxxx.xxA	6008AAxxx.xxA	6010BCxxx.xxA
With sensitivity detection PRIASED®		●	●		●	●		●
PRIASAFE™			●			●		●
Sensor front machinable	●	●	●	●	●	●	●	●
Possible legth (in mm):								
41 ... 160						●		●
44 ... 160	●	●		●	●			
46 ... 160			●					
50 ... 160							●	
Scope of delivery:								
Mounting nut type 6546A	●	●	●	●	●	●	●	●
Protection cap type 1308A	●	●	●	●	●	●	●	●
Identification plate	●	●	●	●	●	●	●	●
Accessories:								
Mounting / extracting tool for compact sensor type 6573A	●	●	●	●	●	●	●	●
Assembly tool for mounting nut type 6563B	●	●	●	●	●	●	●	●
Quick disconnect cable type 6100Ex.xx-102	●	●	●	●	●	●	●	●
Dummy type 6501Axxx.xxA	●							
Dummy type 6501Bxxx.xxA		●						
Dummy type 6502Bxxx.xxA			●					
Dummy type 6503Axxx.xxA				●				
Dummy type 6503Bxxx.xxA					●			
Dummy type 6506BCxxx.xxA						●		
Dummy type 6508Axxx.xxA							●	
Dummy type 6510BCxxx.xxA								●

Cavity Pressure Compact Sensors with Quick Disconnect Type A1

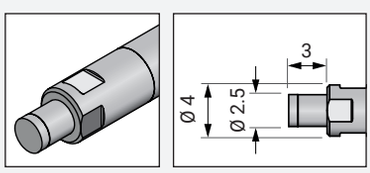
Type 6006BCxxx.xxA1



Type 6008AAxxx.xxA1



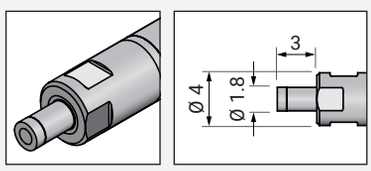
Type 6010BCxxx.xxA1



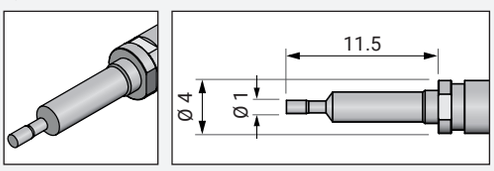
	6006BCxxx.xxA1	6008AAxxx.xxA1	6010BCxxx.xxA1
With sensitivity detection PRIASED®	•		•
With PRIASAFE™	•		•
Sensor front machinable	•	•	•
Possible legth (in mm):			
24 ... 160	•		•
33 ... 160		•	
Scope of delivery:			
Mounting nut type 6549A	•	•	•
Protection cap type 1313B	•	•	•
Identification plate	•	•	•
Accessories:			
Quick disconnect cable type 6102Ex.xxA1-102	•	•	•
Assembly tool for mounting nut 6575A	•	•	•
Mounting / extracting tool for compact sensor with quick disconnect type 6576A	•	•	•
Dummy type 6506BCxxx.xxA1	•		
Dummy type 6508Axxx.xxA1		•	
Dummy type 6510BCxxx.xxA1			•

Cavity Pressure Compact Sensors with Quick Disconnect Type A2

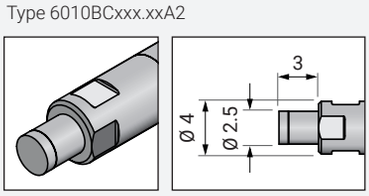
Type 6006BCxxx.xxA2



Type 6008AAxxx.xxA2



Type 6010BCxxx.xxA2



	6006BCxxx.xxA2	6008AAxxx.xxA2	6010BCxxx.xxA2
With sensitivity detection PRIASED®	•		•
With PRIASAFE™	•		•
Sensor front machinable	•	•	•
Possible length (in mm):			
30 ... 160	•		•
39 ... 160		•	
Scope of delivery:			
Mounting nut type 6555A	•	•	•
Protection cap type 1317A	•	•	•
Identification plate	•	•	•
Accessories:			
Assembly tool for mounting nut type 6555A, consists of: torque wrench type 1320A and bit type 1331A	•	•	•
Bit set for floating quick disconnect type 1322A	•	•	•
Quick disconnect cable type 6200Ax.xx-102	•	•	•
Mounting / extracting tool for compact sensors with quick disconnect type 6576A	•	•	•
Dummy type 6506BCxxx.xxA2	•		
Dummy type 6508Axxx.xxA2		•	
Dummy type 6510BCxxx.xxA2			•

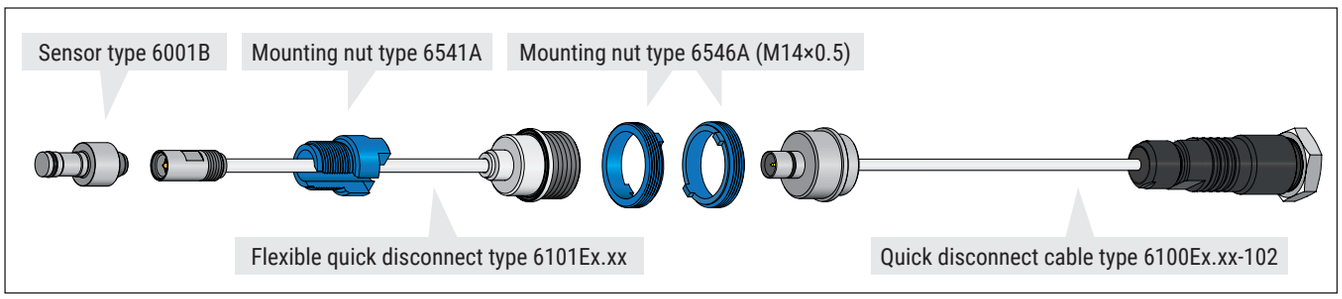
Flexible Quick Disconnects for Cavity Pressure Sensors

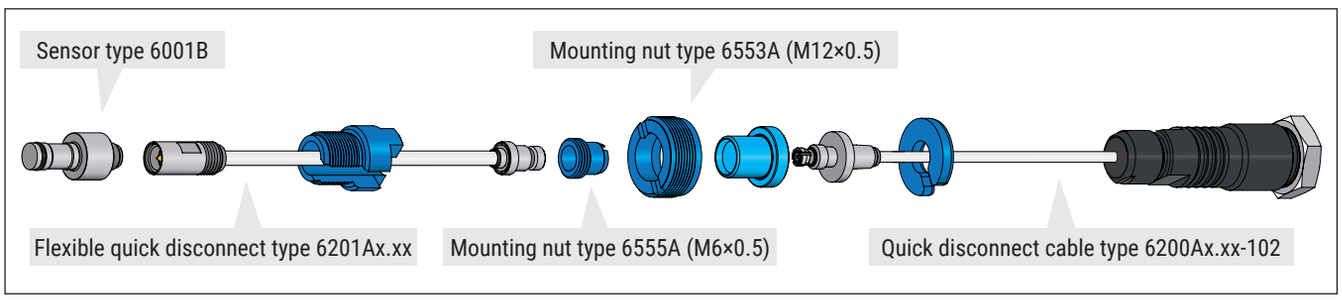
Many injection molding parts are not produced directly in the mold platen, but with the aid of mold inserts. This facilitates the production of the cavities and the handling during maintenance. However, the use of cavity pressure and cavity temperature sensors is often limited here due to space constraints. In addition, handling the connection cables of permanently installed sensors is very impractical when installing and removing the mold inserts.

Flexible quick disconnects for cavity pressure sensors allow the installation and removal of mold inserts by means of a simple plug-in connection, while the sensors themselves remain in the mold insert. This method is very reliable, especially because the sensors do not remain as bolts in the mold plate and can be damaged, but are safely packed and installed in the mold insert after removal. This means that sensors can also be used in interchangeable inserts, which are exchanged on the machine, without mounting problems.

The decisive advantage of this system is that different mold inserts with different sensor positions can be used without changing the position of the quick disconnect. In contrast to a sensor installed in the mold plate itself, the sensor position can still be selected very flexibly according to the molding part, regardless of the size of the mold insert.

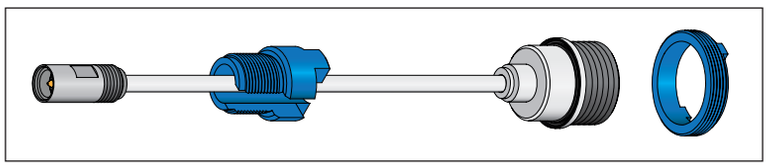
The following examples show measuring chains of flexible quick disconnects with corresponding quick disconnect cables. The upper picture shows variant A for installation in a standard mold insert, the lower picture shows variant A2 for installation in the floating mold insert.



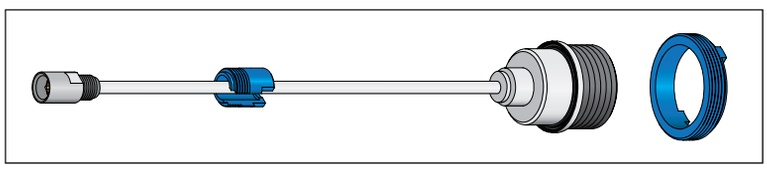


Flexible Quick Disconnects for Mounting in Standard Mold Insert

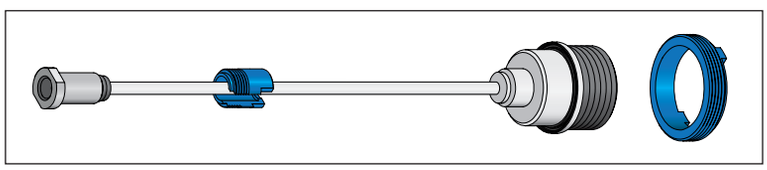
Types 6101Ex.xx, 6106Ax.xx



Type 6103Ex.xx



Type 6104Bx.xx

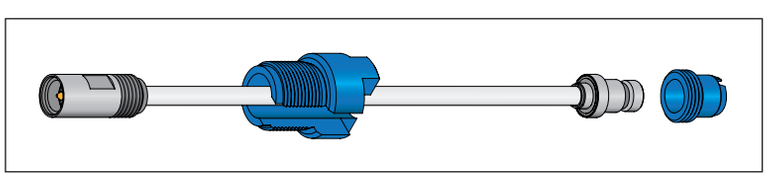


	6101Ex.xx	6103Ex.xx	6104Bx.xx	6106Ax.xx
Compatible with sensors:				
All cavity pressure sensors type 6001B	●			
All cavity pressure sensors type 6002B	●			
All cavity pressure sensors type 6003B	●			
All cavity pressure sensors type 6006BC		●		
All cavity pressure sensors type 6007BC		●		
All cavity pressure sensors type 6010BC		●		
All cavity pressure sensors type 6008AA			●	
All cavity pressure sensors type 6001A				●
All cavity pressure sensors type 6003A				●
Scope of delivery:				
Protection cap type 1308A	●	●	●	●
Mounting nut type 6541A (in scope of delivery of the sensor)	●			●
Mounting nut type 6544B (in scope of delivery of the sensor)		(●)	●	
Mounting nut type 6546A	●	●	●	●
Accessories:				
Mounting / extracting tool for quick disconnect type 6573A	●	●	●	●
Assembly tool for mounting nut type 6563B	●	●	●	●
Quick disconnect cable type 6100Ex.xx-102	●	●	●	●

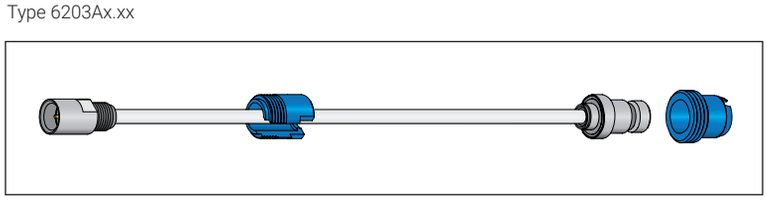
(●) Only in combination with sensor type 6007BC

Flexible Quick Disconnects for Mounting in Floating Mold Insert

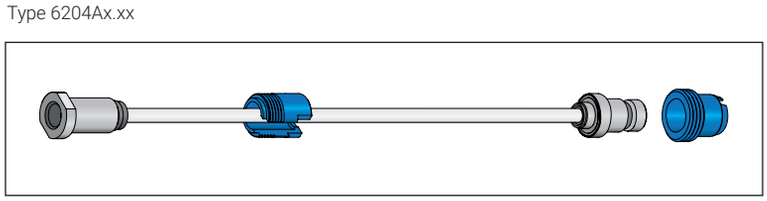
Type 6201Ax.xx



Type 6203Ax.xx



Type 6204Ax.xx



	6201Ax.xx	6203Ax.xx	6204Ax.xx
Compatible with sensors:			
All cavity pressure sensors type 6001B	●		
All cavity pressure sensors type 6002B	●		
All cavity pressure sensors type 6003B	●		
All cavity pressure sensors type 6006BC		●	
All cavity pressure sensors type 6007BC		●	
All cavity pressure sensors type 6010BC		●	
All cavity pressure sensors type 6008AA			●
Scope of delivery:			
Protection cap type 1317A	●	●	●
Mounting nut type 6541A (in scope of delivery of the sensor)	●		
Mounting nut type 6544B (in scope of delivery of the sensor)		(●)	
Mounting nut type 6555A	●	●	●
Accessories:			
Mounting / extracting tool for quick disconnect type 6576A	●	●	●
Assembly tool for mounting nut (6555A) consists of: torque wrench type 1320A and bit type 1331A	●	●	●
Bit set for floating quick disconnect type 1322A	●	●	●
Quick disconnect cable type 6200Ax.xx-102	●	●	●

(●) Only in combination with sensor type 6007BC

Piezoelectric Force Sensors

The piezoelectric force sensor type 6411B stands out in its small dimension and its ability to be equipped with a separable sensor cable (type 1006C). The separable cable give the advantage of allowing the sensor to still be used, even if the cable is damaged.

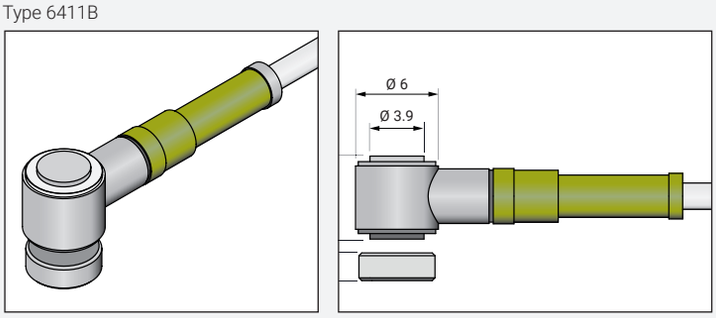
The piezoelectric force sensors of the types 6413A, 6414A and 6415A are installed behind the sleeve of the sleeve ejector pin, and measure the cavity pressure indirectly. The actual ejector pin is guided through the central bore and does not influence the force measurement. Indirect pressure measurement is used if the space conditions near the cavity do not allow the installation of directly measuring sensors.

In principle, piezoelectric force sensors are not only suitable for the injection molding process, but can also be used for industrial force measurement in general, for example for monitoring production processes.

Technical Data

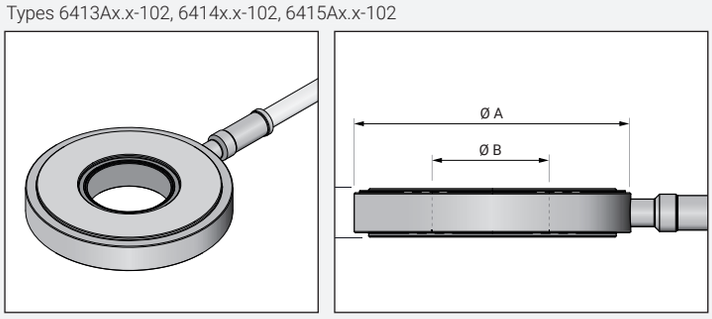
Property	6411B	6413A	6414A	6415A
Maximum mold temperature	0 ... 200 °C 32 ... 392 °F	-20 ... 120 °C -4 ... 248 °F		
Sensitivity	4.4 pC / N	4.3 pC / N		
Measuring range	0 ... 2.5 kN	0 ... 7 kN	0 ... 26 kN	0 ... 62 kN
Linearity deviation	< ± 1%			

Type 6411B



	6411B	6411Bx.x-102	6413Ax.x-102	6414Ax.x-102	6415Ax.x-102
Scope of delivery:					
Pressure disc type 6412A	•	•			
Mounting plate type 6581B	•	•	•	•	•
Identification plate	•	•	•	•	•
Cables:					
Connection cable types 1041A / 1049B		•	•	•	•
Multi-pin connection cable types 1045B / 1047A / 1054B		•	•	•	•
Extension cable type 1043B		•	•	•	•
Accessories:					
Multi-channel connector box for pressure signals type 1195A-8p		•	•	•	•

Types 6413Ax.x-102, 6414x.x-102, 6415Ax.x-102



Dimensions

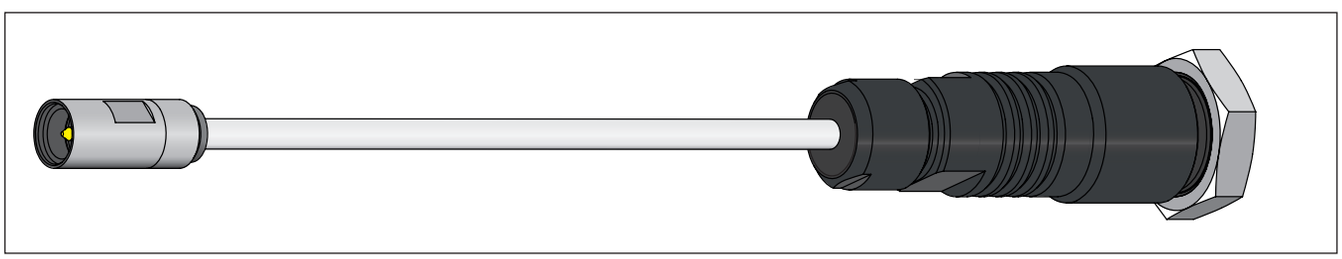
Sensor	A	B	C
Type 6413Ax.x-102	12 mm	4.1 mm	3 mm
Type 6414Ax.x-102	20 mm	8.1 mm	3.5 mm
Type 6415Ax.x-102	30 mm	12.1 mm	4 mm

Cables for Cavity Pressure Sensors

PRIAMUS cavity pressure sensors are used worldwide in very different installation situations. Depending on the installation situation, additional cables are required which are already included in the scope of delivery of the cavity pressure sensors or available as accessories.

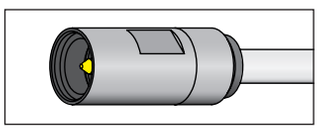
Connection Cable for Cavity Pressure Sensors

All connection cables for cavity pressure sensors are equipped with a Fischer connector type KBE 102 neg. TRIAX. X.x is the cable length in metres [m]. When ordering, please specify the desired cable length.

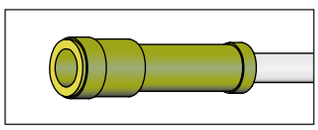


Example: connection cable type 1002Dx.x with Fischer connector type KBE 102 neg. TRIAX

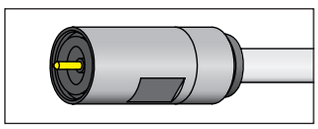
Type 1002Dx.x



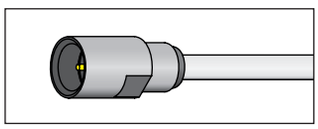
Type 1006Cx.x



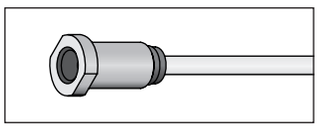
Type 1009Bx.x



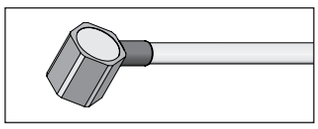
Type 1010Cx.x



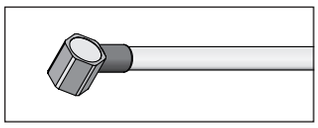
Type 1011Ax.x



Type 1019Ax.x



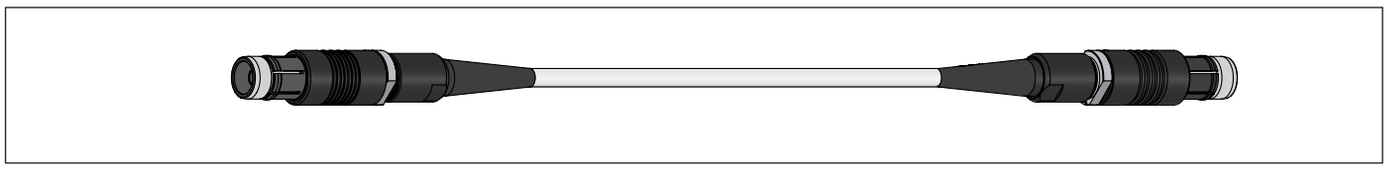
Type 1020Ax.x



Compatible with sensors:	1002Dx.x	1006Cx.x	1009Bx.x	1010Cx.x	1011Ax.x	1019Ax.x	1020Ax.x
All standard cavity pressure sensors of the types 6001A and 6003A	•						
All piezoelectric force sensors of the type 6411B		•					
All standard cavity pressure sensors of the types 6001B, 6002B and 6003B			•				
All miniature cavity pressure sensors of the types 6006BC, 6007BC and 6010BC				•			
All miniature cavity pressure sensors of the type 6008AA					•		
All standard cavity pressure sensors with angled connectors of the types 6001B, 6002B and 6003B						•	
All miniature cavity pressure sensors with angled connectors of the types 6006BC and 6010BC							•

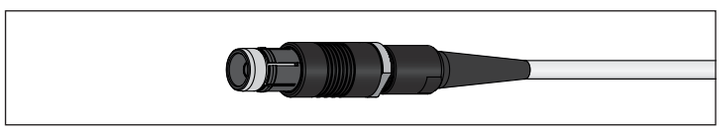
Connection Cables for Cavity Pressure Sensors

We offer two types of connection cables: single-channel and multi-pin connection cables.
For both types, x indicates the cable length in metres [m]. When ordering, please specify the desired cable length.

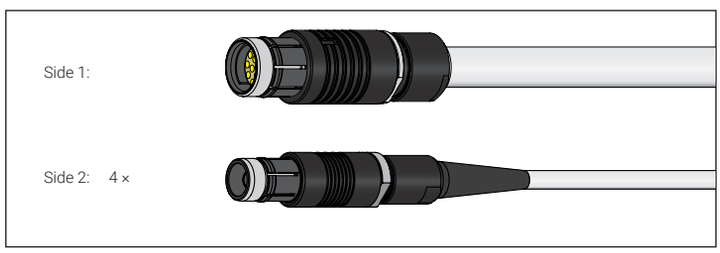


Example: type 1041Ax with Fischer connector type S 102 pos. TRIAX on both sides.

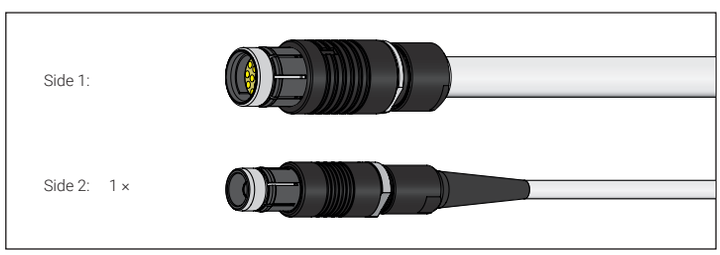
Type 1041Ax



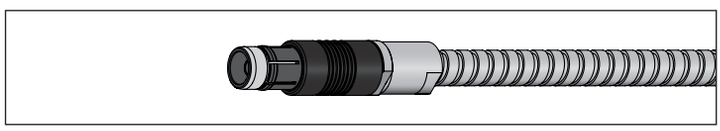
Type 1045Bx



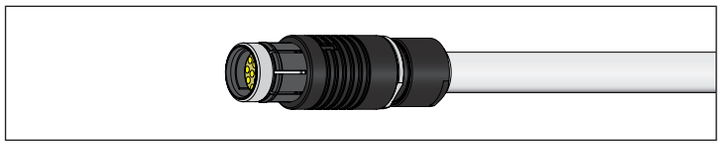
Type 1047Ax



Type 1049Bx



Type 1054Bx

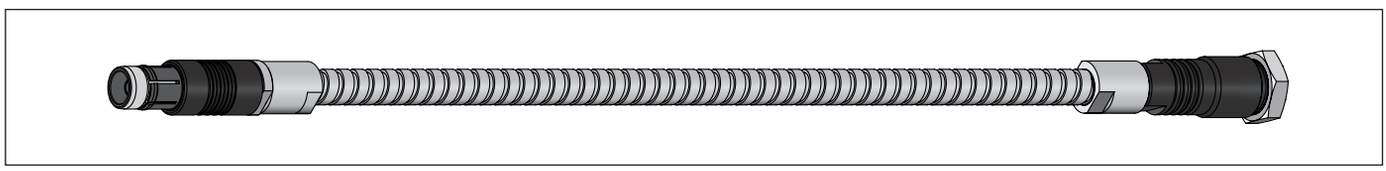


	1041Ax	1045Bx	1047Ax	1049Bx	**1054Bx**
Single-channel connection cable	●			●	
Multi-pin connection cable		●	●		●
Coat material:					
Plastic	●	●	●		●
Metal				●	
Compatible with sensor type:					
All cavity pressure sensors	●	●	●	●	●
Connectors:					
Both sides: Fischer connector type S 102 pos. TRIAX	●			●	
Both sides: Fischer connector type S 104 neg. 16-pin (Code 1)					●
Side 1: Fischer connector type S 104 neg. 16-pin (Code 1) Side 2: Fischer connector type S 102 pos. TRIAX			●		
Side 1: Fischer connector type S 104 neg. 16-pin (Code 1) Side 2: 4 × Fischer connector type S 102 pos. TRIAX		●			

Extension Cable for Cavity Pressure Sensors

The extension cable type 1043Bx is compatible with all cavity pressure sensors. The extension cable is surrounded by a metal sheath.

x is the cable length in metres [m]. Please indicate the desired cable length when ordering.

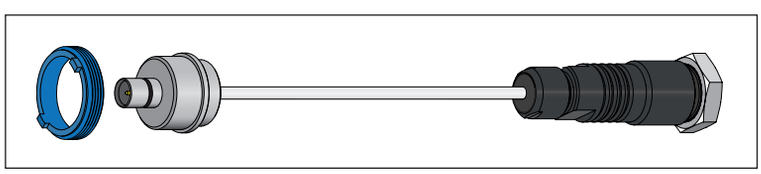


Side 1 with Fischer connector type 102 pos. TRIAX, side 2 with Fischer connector type KBE 102 neg. TRIAX

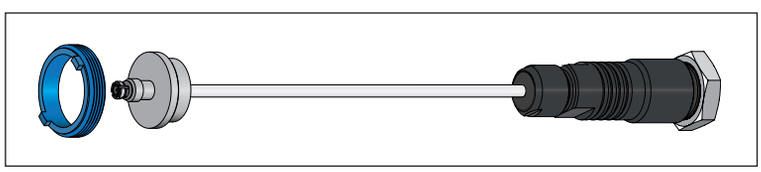
Quick Disconnect Cables for Cavity Pressure Sensors

X.xx is the cable length in metres [m]. Please indicate the desired cable length when ordering.

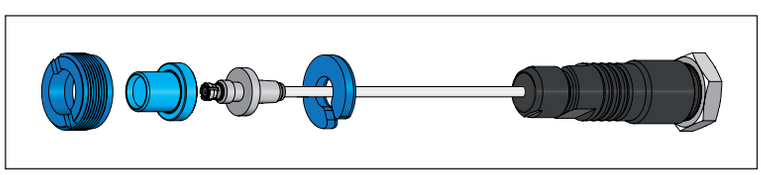
Type 6100Ex.xx-102



Type 6102Ex.xxA1-102



Type 6200Ax.xx-102



	6100Ex.xx-102	6102Ex.xxA1-102	6200Ax.xx-102
Mounting type:			
Mounting in standard mold insert	•	•	
Mounting in floating mold insert			•
Compatible with:			
Cavity pressure compact sensors with quick disconnect type A	•		
Cavity pressure compact sensors with quick disconnect type A1		•	
Cavity pressure compact sensors with quick disconnect type A2 (for mounting into floating mold insert)			•
Flexible quick disconnects for cavity pressure sensors	•		
Flexible quick disconnects for cavity pressure sensors (for mounting into floating mold insert)			•
Scope of delivery:			
Protection cap type 1308A	•		
Protection cap type 1313A		•	
Mounting nut type 6546A	•	•	
Support ring type 6552A			•
Mounting nut type 6553A			•
Guiding sleeve type 6554B			•
Mounting plate type 6581B	•	•	•
Accessories:			
Assembly tool for mounting nut type 6563B	•	•	
Mounting / extracting tool for quick disconnect cable type 6573A	•		
Mounting / extracting tool for quick disconnect cable type 6576A		•	•
Assembly tool for mounting nut (6553A) consists of: torque wrench type 1320A and bit type 1330A			•
Bit set for floating quick disconnects type 1322A			•

Cavity Temperature Sensors

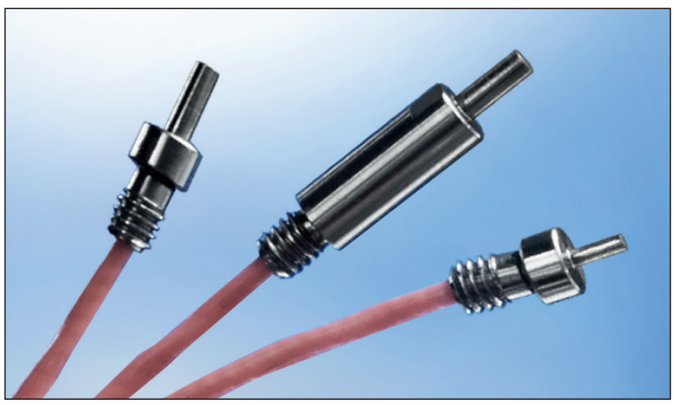
In addition to the cavity pressure, the cavity temperature plays a key role in process monitoring, open-loop and closed-loop process control.

PRIAMUS cavity temperature sensors have a high reaction speed. Our sensors are specially optimized thermocouples of the type N (NiCrSi-NiSi). This thermocouple combination was chosen because, compared to other thermocouples, it does not show any corrosion and is not subject to irreversible temperature shifts.

As with the cavity pressure sensors, our cavity temperature sensors also preferably use signal lines with a secure ground connection and connectors. In order to avoid interference such as signal noise due to grounding problems, we do not use open cable ends as a matter of principle.

Dynamic Temperature Measurement

Temperature plays a decisive role in the injection molding process, because the injection molding process cannot be described by cavity pressure alone.



In addition to temperature measurement, cavity temperature sensors are also used to detect the position of the plastic melt in real time. In order to correctly control and regulate the injection molding process, a very short reaction time of the sensors is crucial. Conventional thermocouples are simply too slow for this. PRIAMUS cavity temperature sensors have been developed and optimized especially for this task. Each sensor is also checked for its reaction speed before delivery.

In contrast to static temperature calibration, there are no applicable standards for dynamic behaviour, which is why specially developed test procedures are used.

Miniature and Heavy-Duty Cavity Temperature Sensors

The melt front is automatically detected when the temperature sensor is reached and used for control and regulation tasks. In order to be able to react to this event as quickly as possible, the reaction speed of the sensors has been optimised.

With a few exceptions, all cavity temperature sensors are available with a hardened sensor front. This significantly increases their service life, especially when using abrasive or chemically aggressive melts.

Miniature and heavy-duty cavity temperature sensors are equipped with a triaxial connector, which in practice can be connected very easily and without positioning, and at the same time offers the greatest possible security with regard to signal quality.

Technical Data

Properties	Specification	
	Miniature cavity temperature sensors	Heavy-duty cavity temperature sensors
Operating temperature range of cable	0 ... 200 °C	0 ... 320 °C
Standard operating temperature of sensor front	Max. 600 °C	
Operating pressure range	0 ... 2'000 bar	
Thermocouple	N	
Class	1	
Max. deviation according to IEC 584-3 (-40 °C ...1000 °C)	dT: ±0.004xT or ±1.5 K	
Response time switchover to holding pressure and sequential control with PRIAMUS amplifier	4 ms	4 ms (Types 4030, 4032, 4034) 20 ms (Type 4036)

Marking Example

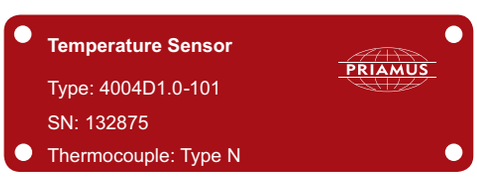
The type number consists of the following elements:

A general overview of number identification can be found in the introduction on page 6 and 7.

	4004Dx.x-101-H
4004	Sensor type
D	Index
x.x	Cable length (in m)
101	Fischer connector type
H	Hardened sensor front

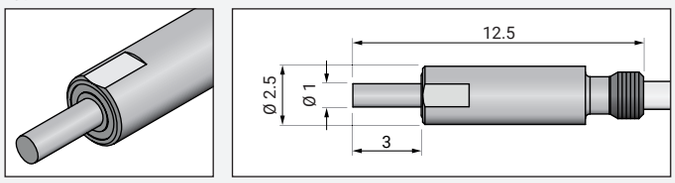
Identification Plate

All cavity temperature sensors are tested and provided with a serial number. Thus all test results are traceable and all sensors are traceable. This data is located on the identification plate, which can be attached to the machine.

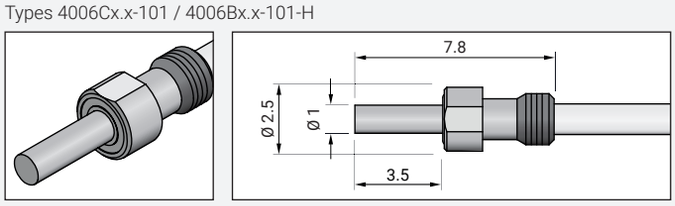


Miniature Cavity Temperature Sensors

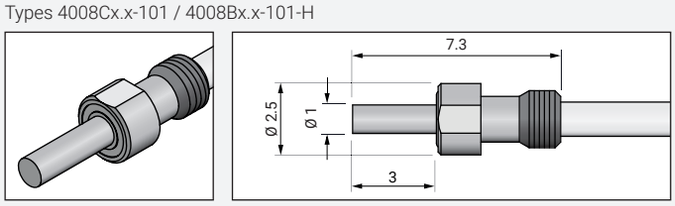
Types 4004Dx.x-101 / 4004Cx.x-101-H



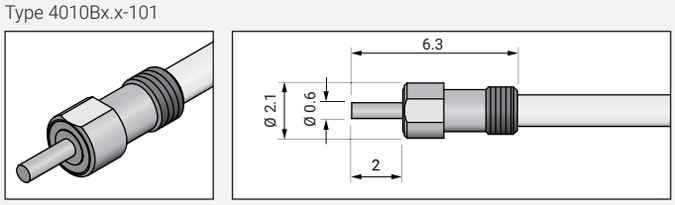
Types 4006Cx.x-101 / 4006Bx.x-101-H



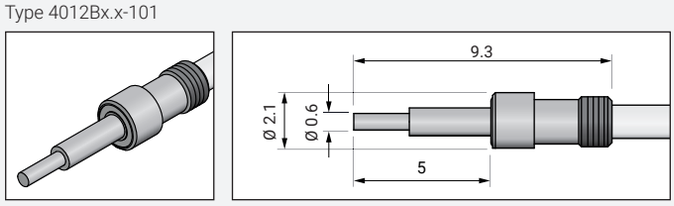
Types 4008Cx.x-101 / 4008Bx.x-101-H



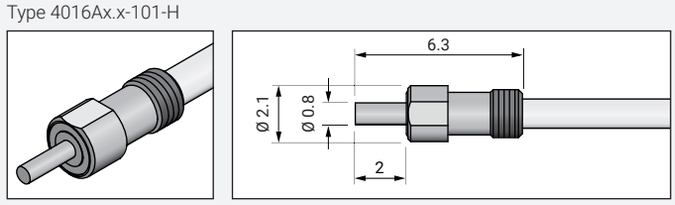
Type 4010Bx.x-101



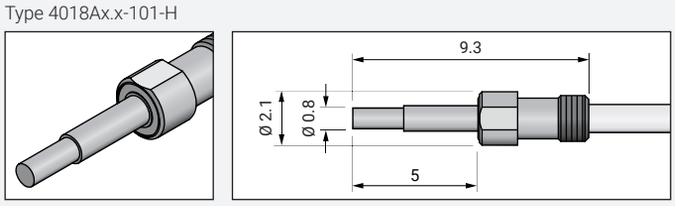
Type 4012Bx.x-101



Type 4016Ax.x-101-H



Type 4018Ax.x-101-H

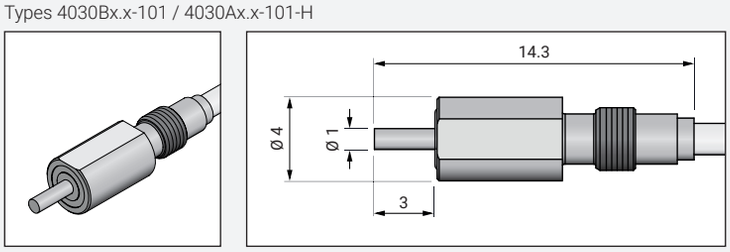


	4004Dx.x-101	4004Cx.x-101-H	4006Cx.x-101	4006Bx.x-101-H	4008Bx.x-101	4008Bx.x-101-H	4010Bx.x-101	4012Bx.x-101	4016Ax.x-101-H	4018Ax.x-101-H
Sensor front:										
Machinable			●	●						
Non-machinable	●	●			●	●	●	●	●	●
Hardened		●		●		●			●	●
Stepped front diameter								●		●
Scope of delivery:										
Distance sleeve type 4521A	●	●	●	●	●	●				
Distance sleeve type 4522A							●	●	●	●
Mounting plate type 4584A	●	●	●	●	●	●	●	●	●	●
Identification plate	●	●	●	●	●	●	●	●	●	●
Accessories:										
Connection cable types 1141Ax / 1149B	●	●	●	●	●	●	●	●	●	●
Multi-pin connection cable types 1144Ax / 1145Ax / 1147Bx	●	●	●	●	●	●	●	●	●	●
Extension cable type 1142Bx	●	●	●	●	●	●	●	●	●	●
Multi-channel connector box for temperature signals type 1194A-8T	●	●	●	●	●	●	●	●	●	●
PRIAFIT® mounting sleeve type 4530A	●	●	●	●	●	●	●	●	●	●
Mounting nut type 4541A	●	●	●	●	●	●				
Mounting nut type 4543A							●	●	●	●
Mounting / extracting tool for sensor type 4561B	●	●	●	●	●	●				
Assembly tool for mounting nut type 4562B	●	●	●	●	●	●	●	●	●	●
Mounting / extracting tool for sensor type 4567A							●	●	●	●
Assembly tool for mounting sleeve type 4575B	●	●	●	●	●	●	●	●	●	●
Dummies:										
Type 4503A	●	●								
Type 4505A			●	●						
Type 4501B					●	●				
Type 4509A							●			
Type 4511A								●		
Type 4515A									●	
Type 4517A										●

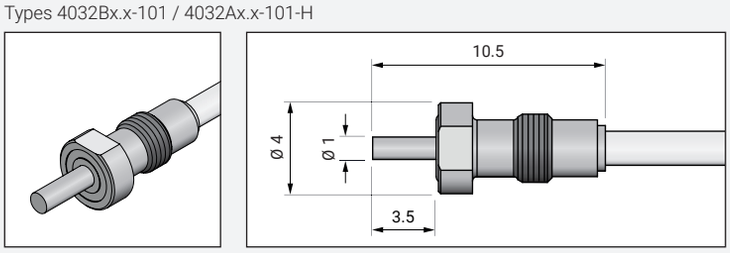
Heavy-Duty Cavity Temperature Sensors

All heavy-duty cavity temperature sensors have an integrated steel braided cable and are equipped with a Fischer connector type KBE 101 neg. TRIAX.

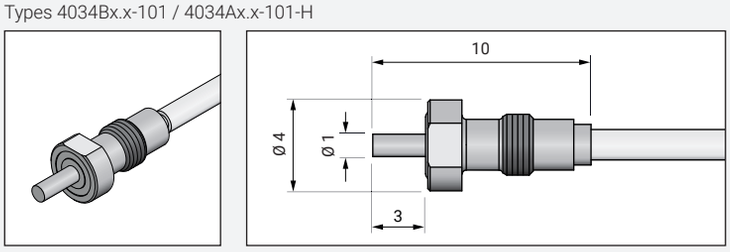
Types 4030Bx.x-101 / 4030Ax.x-101-H



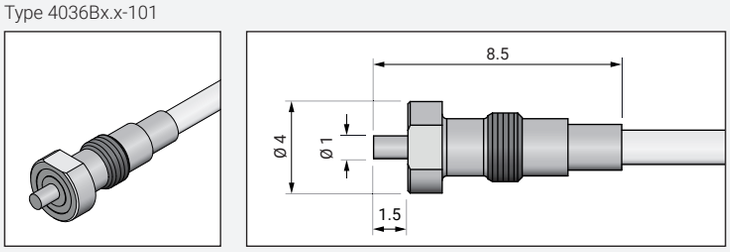
Types 4032Bx.x-101 / 4032Ax.x-101-H



Types 4034Bx.x-101 / 4034Ax.x-101-H



Type 4036Bx.x-101



	4030Bx.x-101	4030Ax.x-101-H	4032Bx.x-101	**4032Ax.x-101-H**	**4034Bx.x-101**	**4034Ax.x-101-H**	**4036Bx.x-101***
Sensor front:							
Machinable			●	●			
Non-machinable	●	●			●	●	●
Hardened		●		●		●	
Scope of delivery:							
Distance sleeve type 4523A	●	●	●	●	●	●	●
Mounting plate type 4584A	●	●	●	●	●	●	●
Mounting nut type 4545A							●
Identification plate	●	●	●	●	●	●	●
Accessories:							
Connection cable types 1141Ax / 1149B	●	●	●	●	●	●	●
Multi-pin connection cable types 1144Ax / 1145Ax / 1147Bx	●	●	●	●	●	●	●
Extension cable type 1142Bx	●	●	●	●	●	●	●
Multi-channel connector box for temperature signals type 1194A-8T	●	●	●	●	●	●	●
PRIAFIT® mounting sleeve type 4532A	●	●	●	●	●	●	●
Mounting nut type 4545A	●	●	●	●	●	●	●
Assembly tool for mounting sleeve type 4575B	●	●	●	●	●	●	●
Mounting / extracting tool for sensor type 4576A	●	●	●	●	●	●	●
Assembly tool for mounting sleeve type 4578A	●	●	●	●	●	●	●
Dummies:							
Type 4531A	●	●					
Type 4533A			●	●			
Type 4534A					●	●	
Type 4536A							●

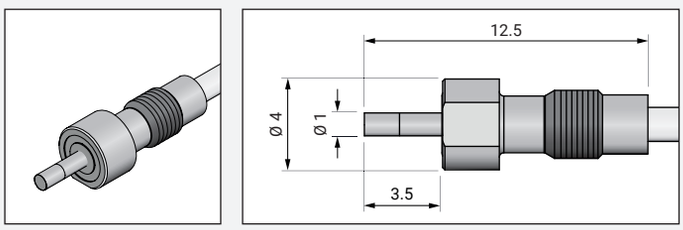
* Prisolaris™ for indirect measuring

Melt Temperature Sensor Type 4050Ax.x-101-H

Melt temperature sensors are used where the plastic melt does not solidify and is constantly in a viscous state, such as in the hot runner manifold, the machine nozzle or the machine cylinder. The melt temperature can be described as a material parameter, while the cavity temperature represents a real process parameter. Melt temperatures are therefore suitable as a reference value for the viscosities determined in the mold or, more generally, for evaluating and monitoring the material properties during the injection molding process.

Melt temperature sensors do have an integrated steel braided cable and are equipped with a Fischer connector type KBE 101.

Type 4050Ax.x-101-H



	4050Ax.x-101-H
Sensor front:	
Machinable	●
Hardened	●
Scope of delivery:	
Mounting nut type 4545A	●
Mounting plate type 4584A	●
Identification plate	●
Cables:	
Single-channel connection cable type 1141Ax	●
Single-channel connection cable type 1149Bx	●
Multi-pin connection cable type 1144Ax	●
Multi-pin connection cable type 1145Ax	●
Multi-pin connection cable type 1147Bx	●
Single-channel extension cable type 1142Bx	●
Accessories:	
Multi-channel connector box for temperature signals type 1194A-8T	●
Assembly tool for mounting sleeve type 4575B	●
Mounting / extracting tool for sensor type 4576A	●
Dummy type 4550A	●

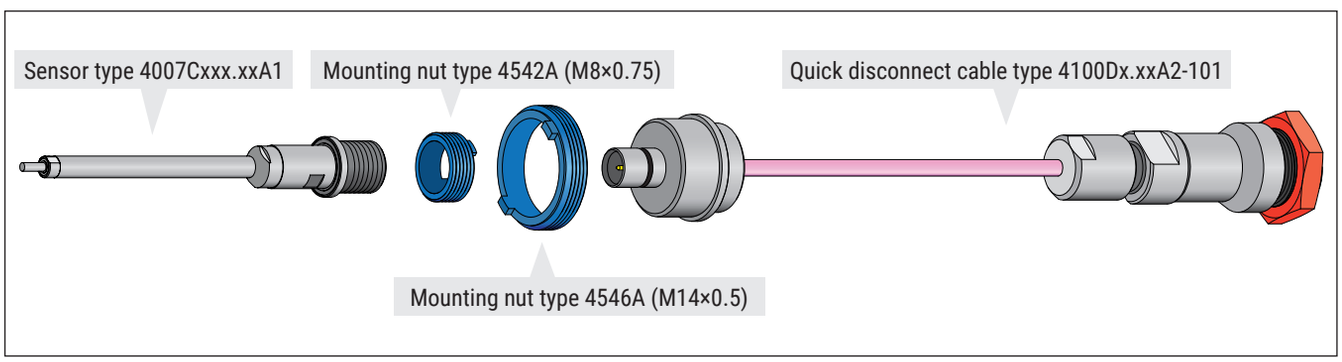
Cavity Temperature Compact Sensors

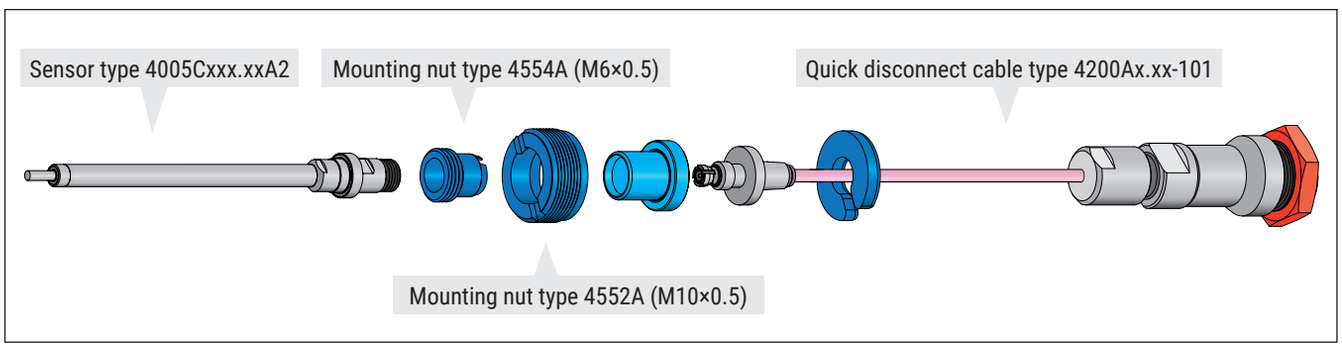
Many injection molding parts are not produced directly in the mold platen, but with the aid of mold inserts. This facilitates the production of the cavities and the handling during maintenance. However, the use of cavity pressure and cavity temperature sensors is often limited by space constraints. In addition, handling the connection cables of permanently installed sensors is often laborious when installing and removing the mold inserts.

So-called compact sensors for pressure and temperature measurement in the injection mold were developed as the preferred solution and as an alternative to flexible quick disconnects with cables. Instead of connecting the sensors inside the mold insert to the disconnect via a connection cable, the compact sensor is fixed to the disconnect via a distance sleeve. This results in an extremely compact and very easy-to-handle solution, which is available in different sizes depending on the application and space requirements.

The length of the compact sensors is variable within given tolerances and must be specified when ordering. The disconnect counterpart in the mold plate is connected to the connector plug via an integrated cable.

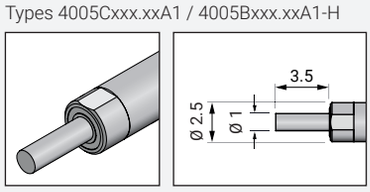
The following two examples show measuring chains of cavity temperature compact sensors with the corresponding quick disconnect cable. The upper picture shows variant A1 for installation in a standard mold plate, the lower picture shows variant A2 for installation in a floating mold plate.



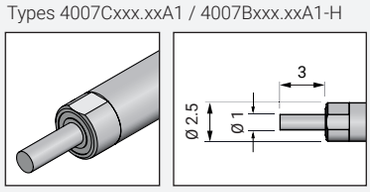


Cavity Temperature Compact Sensors with Quick Disconnect Type A1

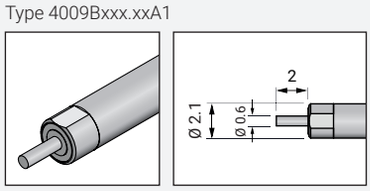
Types 4005Cxxx.xxA1 / 4005Bxxx.xxA1-H



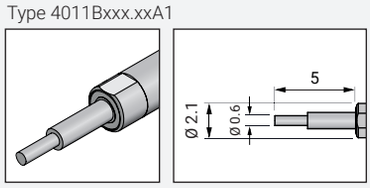
Types 4007Cxxx.xxA1 / 4007Bxxx.xxA1-H



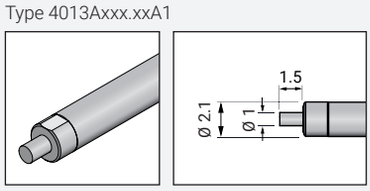
Type 4009Bxxx.xxA1



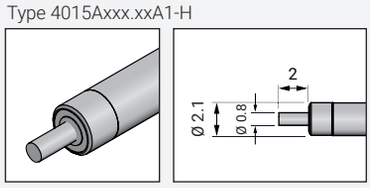
Type 4011Bxxx.xxA1



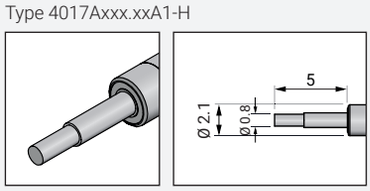
Type 4013Axxx.xxA1



Type 4015Axxx.xxA1-H



Type 4017Axxx.xxA1-H

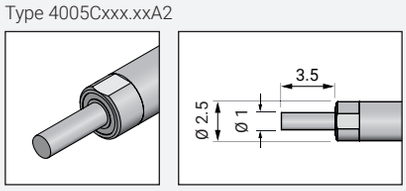


	4005Cxx.xxA1	4005Bxx.xxA1-H	4007Cxxx.xxA1	4007Bxx.xxA1-H	4009Bxxx.xxA1	4011Bxxx.xxA1	4013Axxx.xxA1*	4015Axxx.xxA1-H	4017Axxx.xxA1-H
Sensor front:									
Machinable	●	●							
Non-machinable			●	●	●	●	●	●	●
Hardened		●		●				●	●
Stepped front diameter						●			●
Possible length (in mm):									
22 ... 120							●		
23.5 ... 120	●	●	●	●					
24 ... 120					●			●	
27 ... 120						●			●
Scope of delivery:									
Mounting nut type 4542A	●	●	●	●	●	●	●	●	●
Protection cap type 1301A	●	●	●	●	●	●	●	●	●
Identification plate	●	●	●	●	●	●	●	●	●
Accessories:									
Monting / extracting tool for compact sensor type 4573A	●	●	●	●	●	●	●	●	●
Assembly tool for mounting nut type 4563B	●	●	●	●	●	●	●	●	●
Quick disconnect cable type 4100Dx.xxA2-101	●	●	●	●	●	●	●	●	●
Dummies:									
Type 4505Bxxx.xxA1	●	●							
Type 4507Bxxx.xxA1			●	●					
Type 4509Bxxx.xxA1					●				
Type 4511Bxxx.xxA1						●			
Type 4513Axxx.xxA1							●		
Type 4515Axxx.xxA1								●	
Type 4517Axxx.xxA1									●

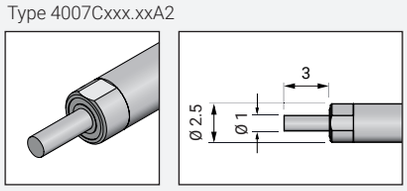
* Prisolaris™ for indirect measuring

Cavity Temperature Compact Sensors with Quick Disconnect Type A2
For Mounting in Floating Mold Insert

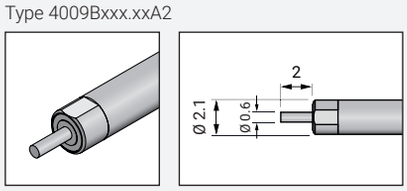
Type 4005Cxxx.xxA2



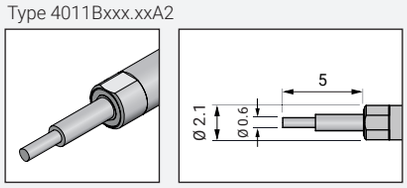
Type 4007Cxxx.xxA2



Type 4009Bxxx.xxA2



Type 4011Bxxx.xxA2



	4005Cxx.xxA2	4007Cxxx.xxA2	4009Bxxx.xxA2	4011Bxxx.xxA2
Sensor front:				
Machinable	●			
Non-machinable		●	●	●
Stepped front diameter				●
Possible length (in mm):				
17 ... 120			●	
18 ... 120		●		
18.5 ... 120	●			
20 ... 120				●
Scope of delivery:				
Mounting nut type 4554A	●	●	●	●
Protection cap type 1317A	●	●	●	●
Identification plate	●	●	●	●
Accessories:				
Mounting / extracting tool for compact sensor type 4571A	●	●	●	●
Assembly tool for mounting nut type 4554A, consists of: torque wrench type 1320A and bit type 1331A	●	●	●	●
Quick disconnect cable type 4200Ax.xx-101	●	●	●	●
Dummies:				
Type 4505Cxxx.xxA2	●			
Type 4507Cxxx.xxA2		●		
Type 4509Bxxx.xxA2			●	
Type 4511Bxxx.xxA2				●

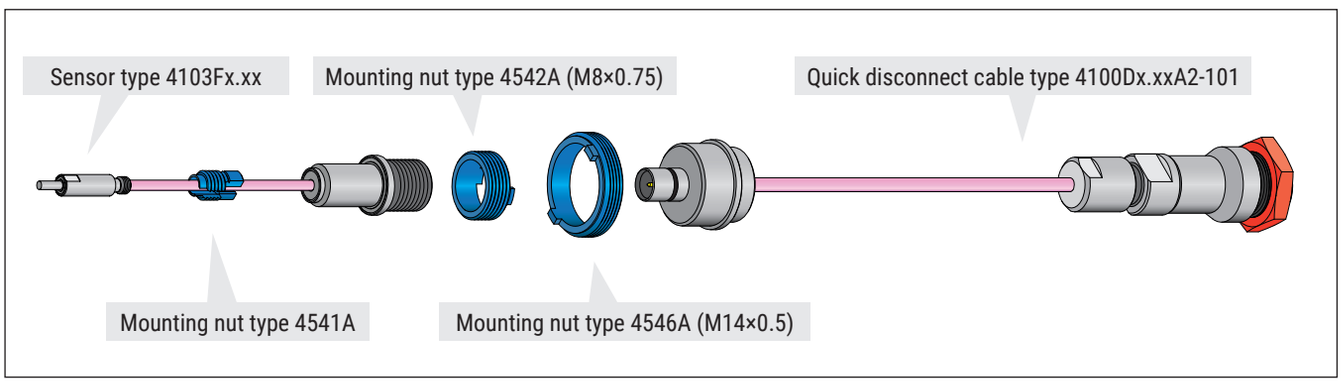
Miniature Cavity Temperature Sensors with Flexible Quick Disconnect

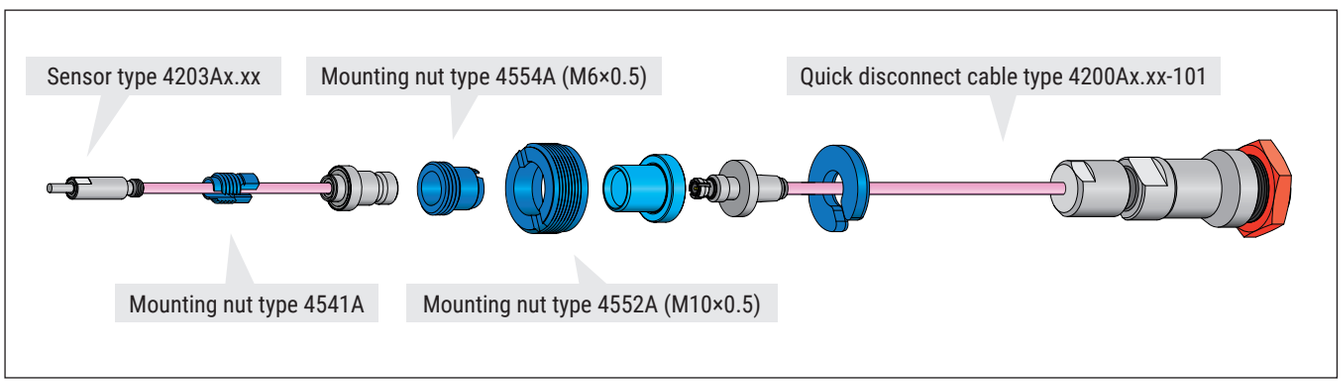
Numerous injection molding parts are not directly produced in the mold platen, but with the aid of mold inserts. This facilitates the production of the cavities and the handling during maintenance. However, the use of cavity pressure and cavity temperature sensors is often limited here due to space constraints. In addition, handling the connection cables of permanently installed sensors is very impractical when installing and removing the mold inserts.

Quick disconnects for cavity temperature sensors allow mold inserts to be installed and removed with a simple plug-in connection, while the sensors themselves remain in the mold insert. This method is very reliable, especially because the sensors do not remain as bolts in the mold platen and can be damaged, but are safely packed in the mold insert even after removal. This means that sensors can also be used in interchangeable inserts, which are exchanged on the machine, without any installation problems.

The decisive advantage of this system is that different mold inserts with different sensor positions can be used without changing the position of the quick disconnect. In contrast to a sensor installed in the mold platen itself, the sensor position can still be selected very flexibly according to the molded part, regardless of the size of the mold insert.

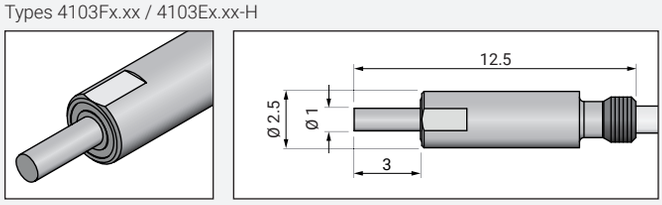
The following two examples show measuring chains with miniature cavity temperature sensors and corresponding flexible quick disconnect cables. The upper picture shows variant A for installation in a standard mold insert, the lower picture shows variant A2 for installation in the floating mold insert.



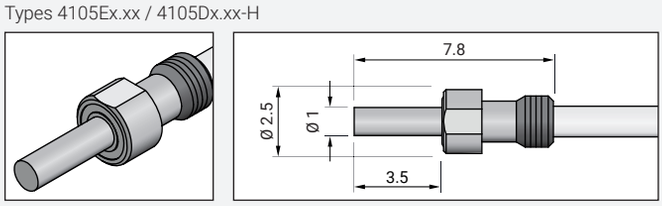


Miniature Cavity Temperature Sensors with Flexible Quick Disconnect for Mounting in Standard Mold Insert

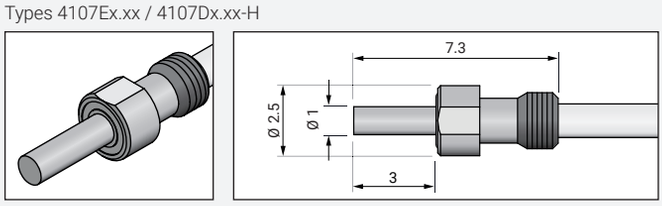
Types 4103Fx.xx / 4103Ex.xx-H



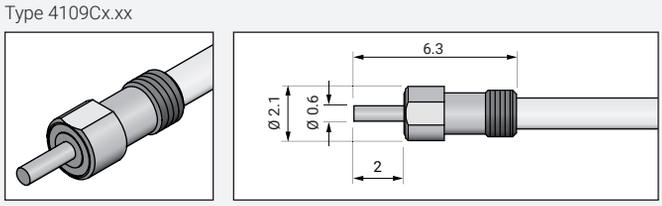
Types 4105Ex.xx / 4105Dx.xx-H



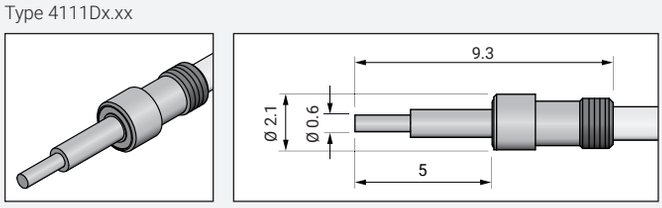
Types 4107Ex.xx / 4107Dx.xx-H



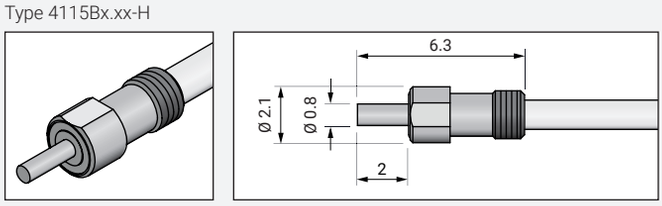
Type 4109Cx.xx



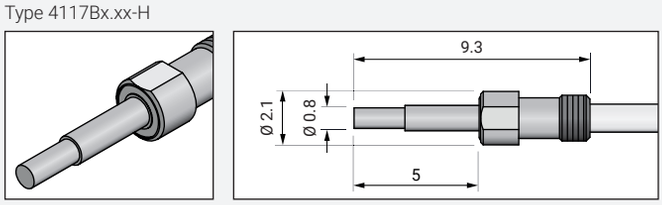
Type 4111Dx.xx



Type 4115Bx.xx-H



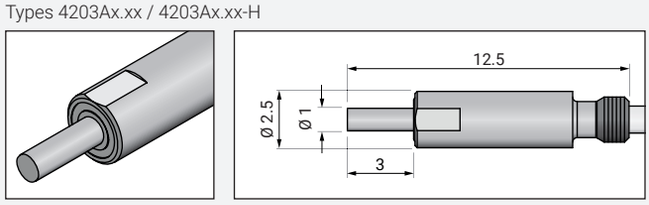
Type 4117Bx.xx-H



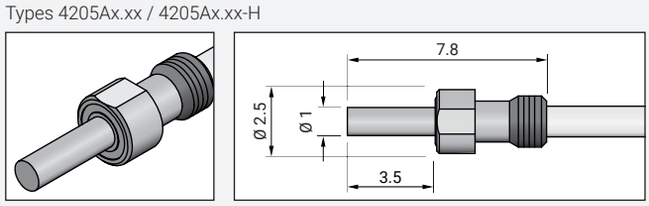
	4103Fx.xx	4103Ex.xx-H	4105Ex.xx	4105Dx.xx-H	4107Ex.xx	4107Dx.xx-H	4109Cx.xx	4111Dx.xx	4115Bx.xx-H	4117Bx.xx-H
Sensor front:										
Machinable			●	●						
Non-machinable	●	●			●	●	●	●	●	●
Hardened		●		●		●			●	●
Stepped front diameter								●		●
Including sensor:										
Type 4003D	●									
Type 4003C-H		●								
Type 4005C			●							
Type 4005B-H				●						
Type 4007C					●					
Type 4007B-H						●				
Type 4009B							●			
Type 4011B								●		
Type 4015A-H									●	
Type 4017A-H										●
Scope of delivery:										
Protection cap type 1301A	●	●	●	●	●	●	●	●	●	●
Mounting nut (sensor side) type 4541A	●	●	●	●	●	●				
Mounting nut (disconnect side) type 4542A	●	●	●	●	●	●	●	●	●	●
Mounting nut (sensor side) type 4543A							●	●	●	●
Identification plate	●	●	●	●	●	●	●	●	●	●
Accessories:										
Quick disconnect cable type 4100Dx.xxA2-101	●	●	●	●	●	●	●	●	●	●
Distance sleeve type 4521A	●	●	●	●	●	●				
Distance sleeve type 4522A							●	●	●	●
PRIAFIT® mounting sleeve type 4530A	●	●	●	●	●	●	●	●	●	●
Mounting / extracting tool for sensor type 4561B	●	●	●	●	●	●				
Assembly tool for mounting nut (sensor side) type 4562B	●	●	●	●	●	●	●	●	●	●
Assembly tool for mounting nut (disconnect side) type 4563B	●	●	●	●	●	●	●	●	●	●
Mounting / extracting tool for sensor type 4567A							●	●	●	●
Mounting / extracting tool for quick disconnect type 4573A	●	●	●	●	●	●	●	●	●	●
Assembly tool for mounting sleeve type 4575B	●	●	●	●	●	●	●	●	●	●

Miniature Cavity Temperature Sensors with Flexible Quick Disconnect for Mounting in Floating Mold Insert

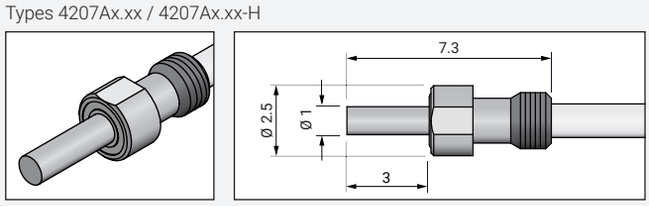
Types 4203Ax.xx / 4203Ax.xx-H



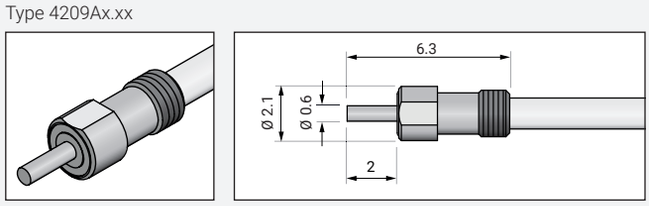
Types 4205Ax.xx / 4205Ax.xx-H



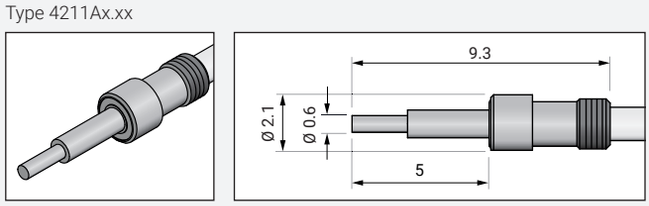
Types 4207Ax.xx / 4207Ax.xx-H



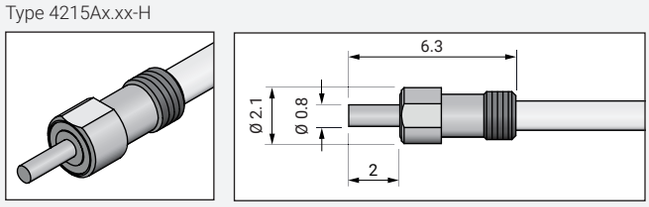
Type 4209Ax.xx



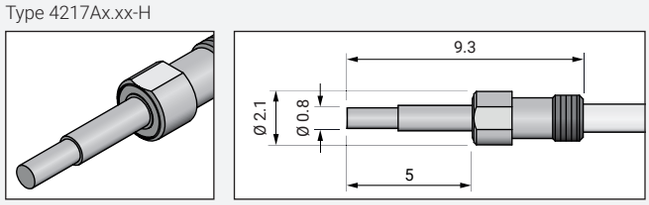
Type 4211Ax.xx



Type 4215Ax.xx-H



Type 4217Ax.xx-H

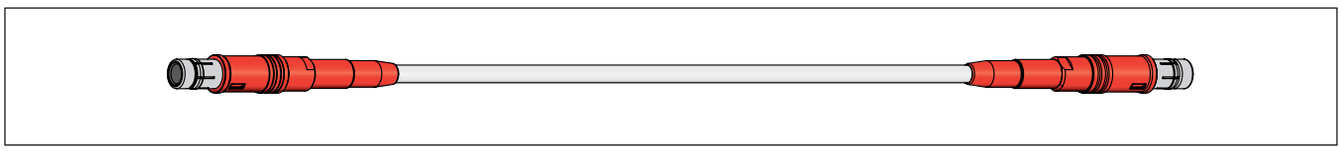


	4203Ax.xx	4203Ax.xx-H	4205Ax.xx	4205Ax.xx-H	4207Ax.xx	4207Ax.xx-H	4209Ax.xx	4211Ax.xx	4215Ax.xx-H	4217Ax.xx-H
Sensor front:										
Machinable			●	●						
Non-machinable	●	●			●	●	●	●	●	●
Hardened		●		●		●			●	●
Stepped front diameter								●		●
Including sensor:										
Type 4003D	●									
Type 4003C-H		●								
Type 4005C			●							
Type 4005B-H				●						
Type 4007C					●					
Type 4007B-H						●				
Type 4009B							●			
Type 4011B								●		
Type 4015A-H									●	
Type 4017A-H										●
Scope of delivery:										
Protecting cap type 1317A	●	●	●	●	●	●	●	●	●	●
Mounting nut (sensor side) type 4541A	●	●	●	●	●	●				
Mounting nut (sensor side) type 4543A							●	●	●	●
Mounting nut (disconnect side) type 4554A	●	●	●	●	●	●	●	●	●	●
Identification plate	●	●	●	●	●	●	●	●	●	●
Accessories:										
Quick disconnect cable type 4200Ax.xx-101	●	●	●	●	●	●	●	●	●	●
Distance sleeve type 4521A	●	●	●	●	●	●				
Distance sleeve type 4522A							●	●	●	●
PRIAFIT® mounting sleeve type 4530A	●	●	●	●	●	●	●	●	●	●
Mounting / extracting tool for sensor type 4561B	●	●	●	●	●	●				
Assembly tool for mounting nut (sensor side) type 4562B	●	●	●	●	●	●	●	●	●	●
Mounting / extracting tool for sensor type 4567A							●	●	●	●
Mounting / extracting tool for quick disconnect type 4571A	●	●	●	●	●	●	●	●	●	●
Assembly tool for mounting sleeve type 4575B	●	●	●	●	●	●	●	●	●	●
Assembly tool for mounting nut type 4554A consists of: torque wrench type 1320A and bit set type 1331A	●	●	●	●	●	●	●	●	●	●

Cables for Cavity Temperature Sensors

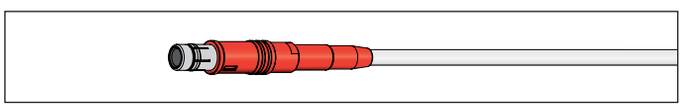
Connection Cables for Cavity Temperature Sensors

We offer two types of connection cables: single-channel and multi-pin connection cables.
X denotes the cable length in metres [m] for both types. When ordering, please specify the required cable length.

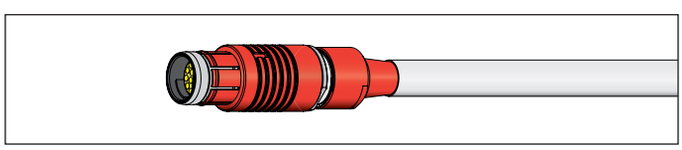


Example: Type 1141Ax with Fischer connector type S 101 pos. TRIAX on both sides.

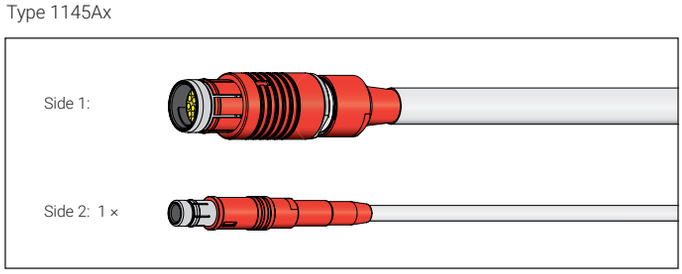
Type 1141Ax



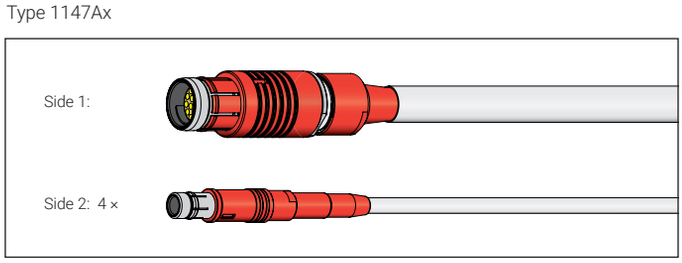
Type 1144Ax



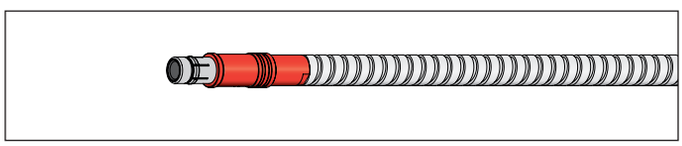
Type 1145Ax



Type 1147Ax



Type 1149Bx

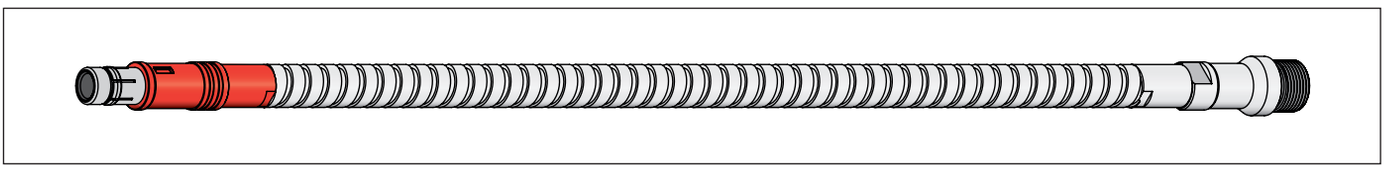


	1141Ax	1144Ax	1145Ax	1147Bx	1149Bx
Connection cable single-channel	•				•
Connection cable multi-pin		•	•	•	
Coat material:					
Plastic	•	•	•	•	
Metal					•
Compatible with sensor type:					
All cavity temperature sensors	•	•	•	•	•
Connectors:					
Both sides: Fischer connector type S 101 pos. TRIAX	•				•
Both sides: Fischer connector type S 104 neg. 19-pin (Code 2)		•			
Side 1: Fischer connector type S 104 neg. 19-pin (Code 2) Side 2: Fischer connector type S 101 pos. TRIAX			•		
Side 1: Fischer connector type S 104 neg. 19-pin (Code 2) Side 2: 4 × Fischer connector type S 101 pos. TRIAX				•	

Extension Cable for Cavity Temperature Sensors

The extension cable type 1142Bx is compatible with all cavity temperature sensors. The extension cable is surrounded by a metal sheath.

X denotes the cable length in metres [m]. When ordering, please specify the required cable length.

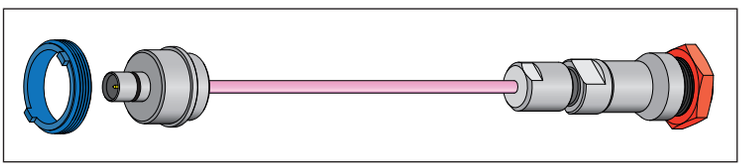


Side 1 with Fischer connector type 101 pos. TRIAX, side 2 with Fischer connector type KBE 101 neg. TRIAX

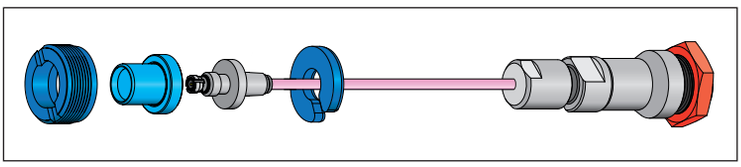
Quick Disconnect Cable for Cavity Temperature Sensors

x.xx denotes the cable length in metres [m]. When ordering, please specify the required cable length.

Type 4100Dx.xxA2-101



Type 4200Ax.xx-101



	4100Dx.xxA2-101	4200Ax.xx-101
Mounting type:		
Mounting in standard mold insert	•	
Mounting in floating mold insert		•
Compatible with:		
Compact cavity temperature sensors with quick disconnect type A1	•	
Compact cavity temperature sensors with quick disconnect type A2 (for mounting in floating mold insert)		•
Miniature cavity temperature sensors with flexible quick disconnect for mounting in standard mold insert	•	
Miniature cavity temperature sensors with flexible quick disconnect for mounting in floating mold insert		•
Scope of delivery:		
Protective cap type 1308A	•	
Mounting nut type 4546A	•	
Support ring type 4551A		•
Mounting nut type 4552A		•
Guiding support type 4553A		•
Mounting plate type 4584A	•	•
Accessories:		
Mounting / extracting tool for quick disconnect cable type 4571A		•
Mounting / extracting tool for quick disconnect cable type 4574A	•	
Assembly tool for mounting nut type 4577B	•	
Assembly tool for mounting nut type 4552A consists of: torque wrench type 1320A and bit type 1330A		•

Order & Mounting Examples

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Order Example 3: FILLCONTROL Monitor 65
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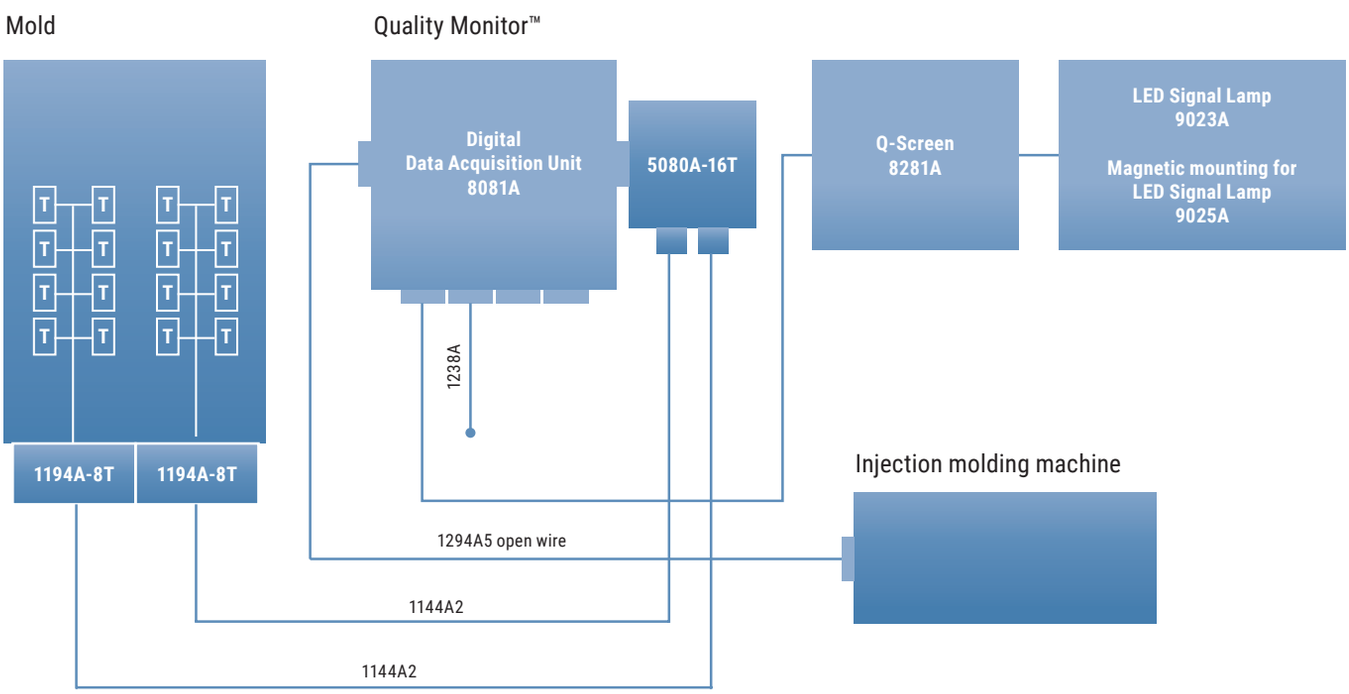
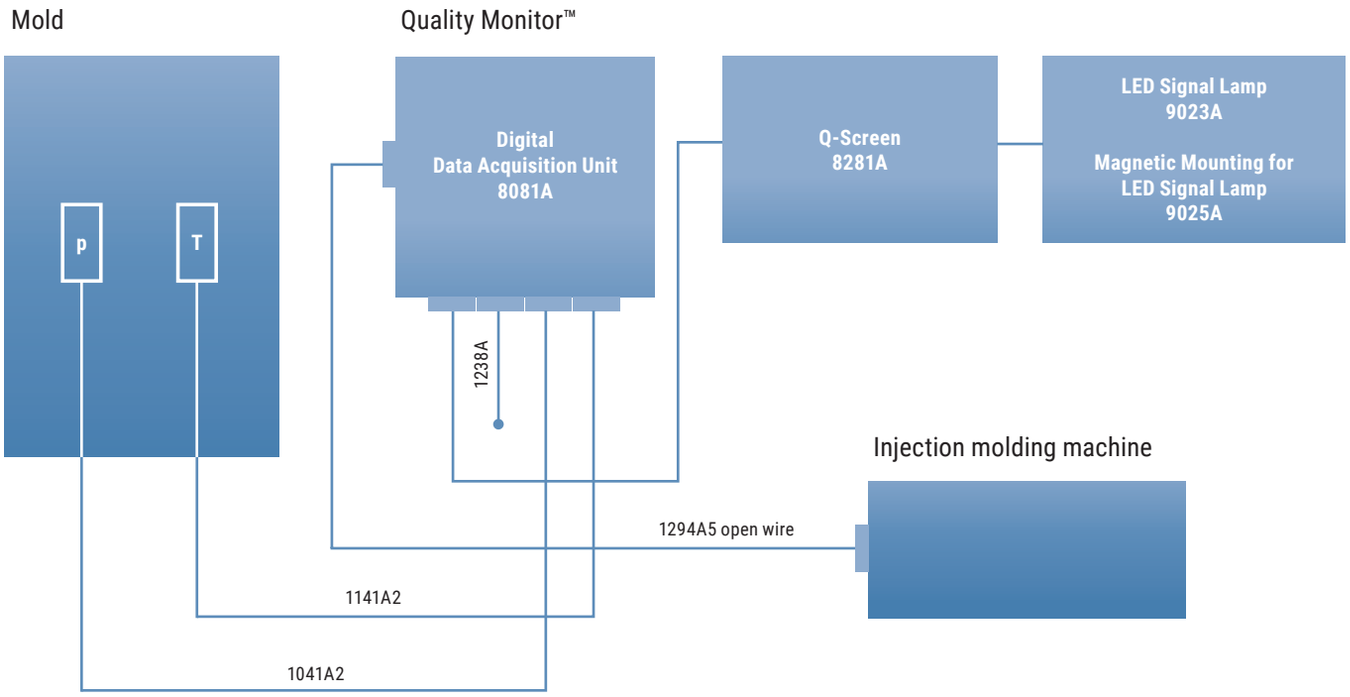
Mounting Examples (Sensor Positioning) 71 - 72

Order Example 1: Quality Monitor™



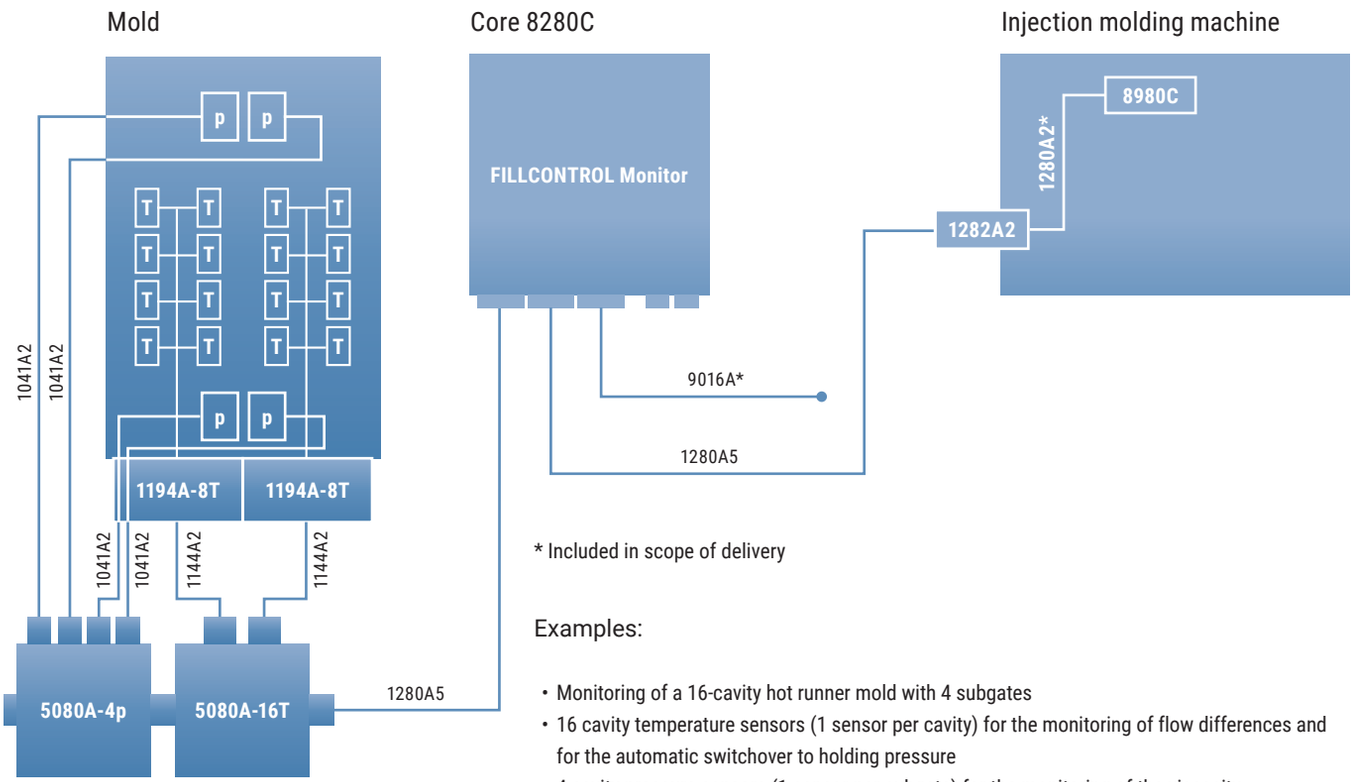
Pos.	Quantity	Type	Description
1	1 ×	8081A	Quality Monitor™ digital data acquisition unit with integrated software
2	1 ×	8281A	Quality Monitor™ QScreen™ control terminal
3	1 ×	9023A	Quality Monitor™ multi-color LED signal lamp
4	1 ×	9025A	Quality Monitor™ magnetic mounting for LED signal lamp
5	1 ×	5080A-16T	BlueLine multi-channel amplifier for 16 temperature signals
6	1 ×	1194A-8T	BlueLine multi-channel connector box for max. 8 temperature signals
7	1 ×	1144A2	Multi-pin connection cable (temperature), 8 channels, length: 2 m
8	1 ×	1294A5 open wire	Connection cable to connect the data acquisition unit to the injection molding machine, As alternative the Arburg or Engel connection cable can be ordered.
9	16 ×	4004D0.2-101	Miniature cavity temperature sensor
10	1 ×	4561B	Mounting / extraction tool for cavity temperature sensors
11	1 ×	1238A	Ethernet cable to connect the data acquisition unit to a network

Order Example 2: Quality Monitor™ (2)



Pos.	Quantity	Type	Description
1	1 ×	8081A	Quality Monitor™ digital data acquisition unit with integrated software
2	1 ×	8281A	Quality Monitor™ Q-Screen™ control terminal
3	1 ×	9023A	Quality Monitor LED signal lamp
4	1 ×	9025A	Quality Monitor™ magnetic mounting for LED signal lamp
5	1 ×	1041A2	Connection cable (pressure), length: 2 m
6	1 ×	1141A2	Connection cable (temperature), length: 2 m
7	1 ×	1294A5 open wire	Connection cable to connect the data acquisition unit to the injection molding machine, As alternative the Arburg or Engel connection cable can be ordered.
8	1 ×	4004D0.2-101	Miniature cavity temperature sensor
9	1 ×	4561B	Mounting / extracting tool for cavity temperature sensors
10	1 ×	6010BC0.4-102	Miniature cavity pressure sensor
11	1 ×	6569A	Mounting / extraction tool for cavity pressure sensors
12	1 ×	6567C	Assembly tool for mounting nut
13	1 ×	1238A	Ethernet cable to connect the data acquisition unit to a network

Order Example 3: FILLCONTROL Monitor



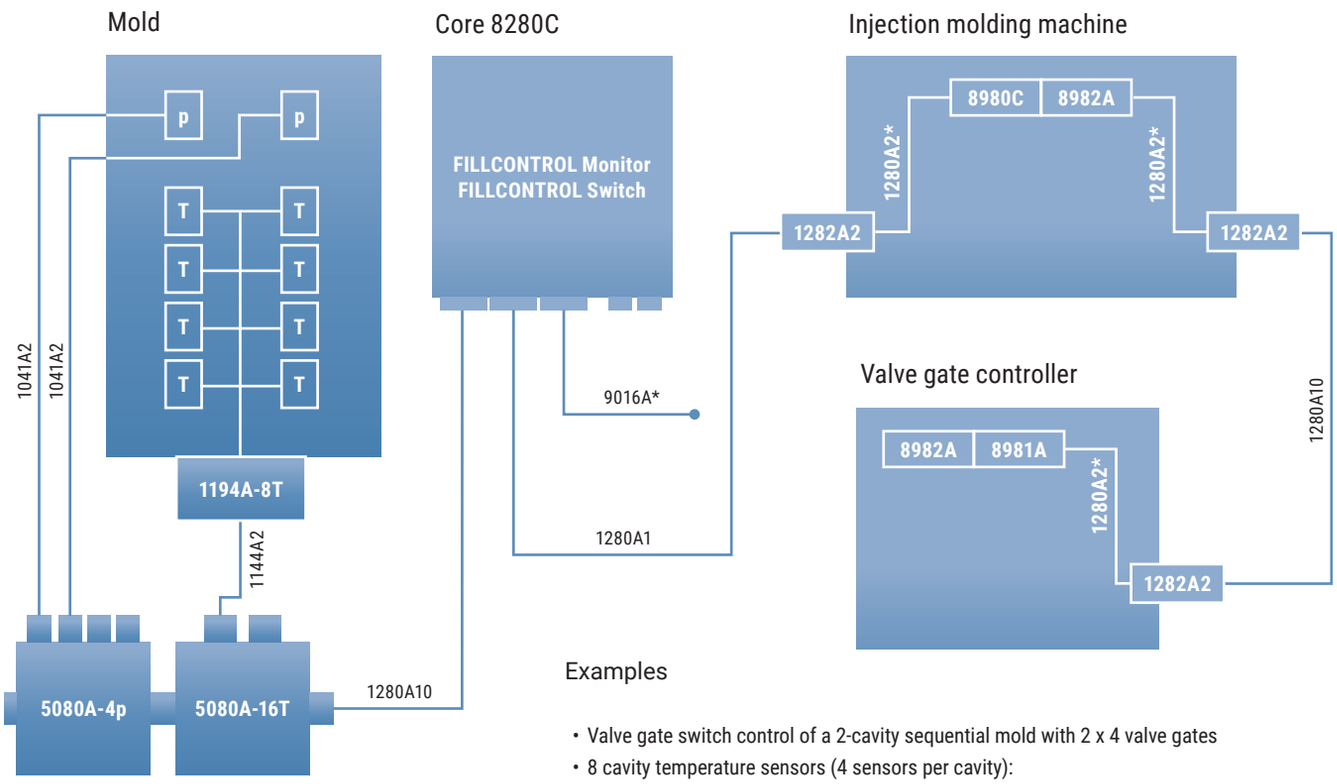
* Included in scope of delivery

Examples:

- Monitoring of a 16-cavity hot runner mold with 4 subgates
- 16 cavity temperature sensors (1 sensor per cavity) for the monitoring of flow differences and for the automatic switchover to holding pressure
- 4 cavity pressure sensors (1 sensor per subgate) for the monitoring of the viscosity

Pos.	Quantity	Type	Description
1	1 ×	7080A Monitor	Software module for monitoring and control of the injection molding process
2	1 ×	8280C	BlueLine Core incl. touch screen display and harddisk
3	1 ×	9021A	Fixing device for BlueLine Core type 8280C
4	1 ×	5080A-16T	BlueLine multi-channel amplifier for 16 temperature signals
5	1 ×	5080A-4p	BlueLine multi-channel amplifier for 4 pressure signals
6	1 ×	8980C	BlueLine I/O Master, Interface for easy connection of digital alarm and switching signals to the machine respectively to the peripherals
7	1 ×	1282A2	Installation kit incl. control cabinet feed through type 1282A for BlueLine hybrid bus cable type 1280A2
8	2 ×	1280A5	BlueLine hybrid bus connection cable, length: 5 m
9	16 ×	4103F0.2	Miniature cavity temperature sensor incl. flexible quick disconnect
10	16 ×	4100D1.0A2-101	Waterproof quick disconnect cable for miniature cavity temperature sensors
11	2 ×	1194A-8T	BlueLine multi-channel connector box for maximum 8 temperature signals
12	2 ×	1144A2	Multi-pin connection cable (temperature), 8 channels, length: 2 m
13	1 ×	4561B	Mounting / extracting tool for cavity temperature sensors
14	1 ×	4562A	Assembly tool for mounting nuts of the sensors (temperature)
15	1 ×	4563B	Assembly tool for mounting nuts of quick disconnects (temperature)
16	4 ×	6001B	Cavity pressure sensor with sensitivity detection PRIASED®
17	4 ×	6101E0.2	Waterproof flexible quick disconnect for cavity pressure sensors for the installation into mold inserts
18	4 ×	6100E1.0-102	Waterproof quick disconnect cable for cavity pressure sensors for the installation into the mold platen
19	4 ×	1041A2	Connection cable for cavity pressure sensors with and without sensitivity detection, length: 2 m
20	1 ×	6561A	Mounting / extracting tool for cavity pressure sensors
21	1 ×	6562B	Assembly tool for mounting nuts of the sensors (pressure)
22	1 ×	6563B	Assembly tool for mounting nuts of quick disconnects (pressure)
23	1 ×	9080A	Top hat rail set for the mounting of BlueLine devices

Order Example 4: FILLCONTROL Switch



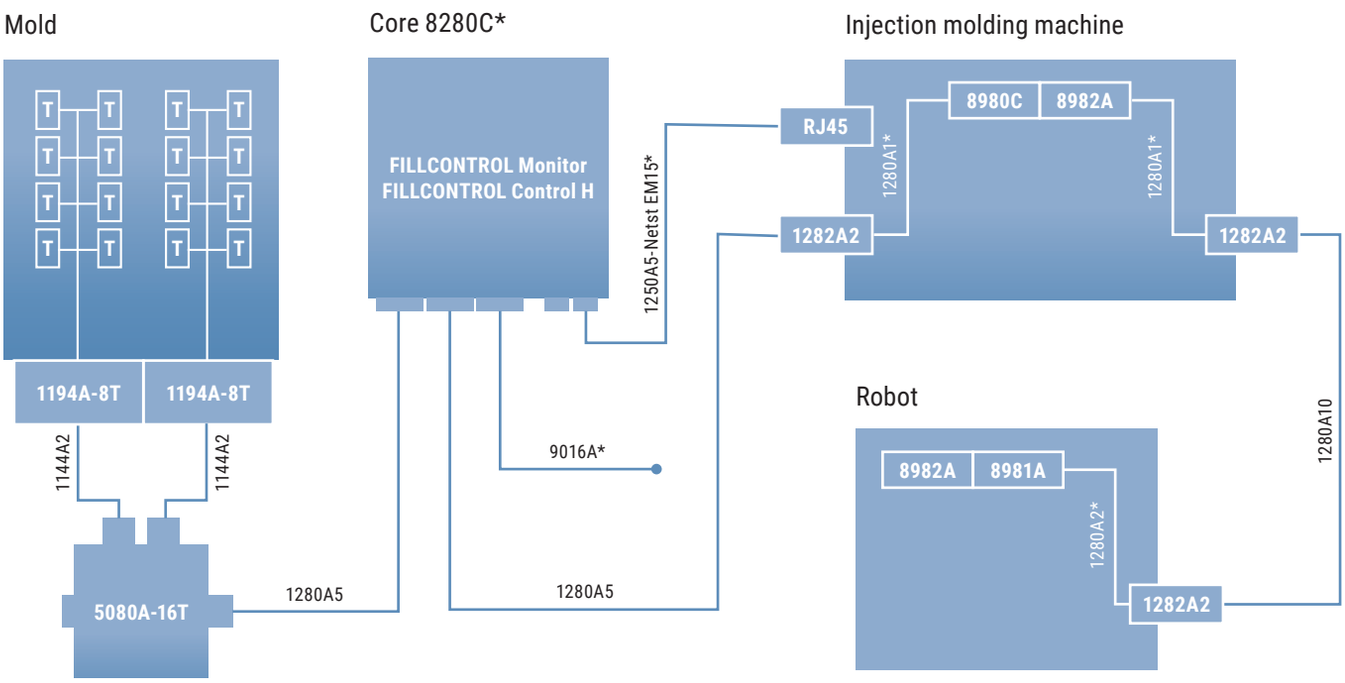
* Included in scope of delivery

Examples

- Valve gate switch control of a 2-cavity sequential mold with 2 x 4 valve gates
- 8 cavity temperature sensors (4 sensors per cavity):
  3 sensors per cavity for the automatic opening of the valve gates
  1 sensor per cavity for the automatic switchover to holding pressure
- 2 cavity pressure sensors (1 sensor per cavity) for the monitoring of the viscosity

Pos.	Quantity	Type	Description
1	1 ×	7080A Monitor	Software module for monitoring and control of the injection molding process
2	1 ×	8280C	BlueLine Core incl. touch screen display and harddisk
3	1 ×	7080A Switch	Software module for the individual monitoring of every single cavity as well as for special switching and monitoring methods such as rotary table and multi-component applications
4	1 ×	9021A	Fixing device for BlueLine Core type 8280C
5	1 ×	5080A-16T	BlueLine multi-channel amplifier for 16 temperature signals
6	1 ×	5080A-4p	BlueLine multi-channel amplifier for 4 pressure signals
7	2 ×	1041A2	Connection cable for cavity pressure sensors with and without sensitivity detection PRIASED®, length: 2 m
8	1 ×	8980C	BlueLine I/O Master, interface for easy connection of digital alarm and switching signals to the machine respectively to the peripherals
9	3 ×	1282A2	Installation kit incl. control cabinet feed through type 1282A and BlueLine hybrid bus cable type 1280A2
10	2 ×	1280A10	BlueLine hybrid bus connection cable, length: 10 m
11	8 ×	4004D0.2-101	Miniature cavity temperature sensor
12	1 ×	1194A-8T	BlueLine multi-channel connector box for maximum 8 temperature signals
13	1 ×	1144A2	Multi-pin connection cable (temperature), 8 channels, length: 2 m
14	1 ×	4561B	Mounting / extracting tool for temperature sensors
15	2 ×	6001B0.4-102	Cavity pressure sensor with sensitivity detection PRIASED®
16	1 ×	1280A1	BlueLine hybrid bus connection cable, length: 1 m
17	1 ×	6561A	Mounting / extracting tool for cavity pressure sensors
18	1 ×	6562B	Assembly tool for mounting nuts
19	1 ×	9080A	Top hat rail set for the mounting of BlueLine devices
20	1 ×	8981A	BlueLine I/O Expander, add-on interface for interfacing of digital alarm and switching signals of the machine and other peripheral devices
21	2 ×	8982A	BlueLine bus interface for the connection of several BlueLine I/O groups of modules

Order Example 5: FILLCONTROL Control H



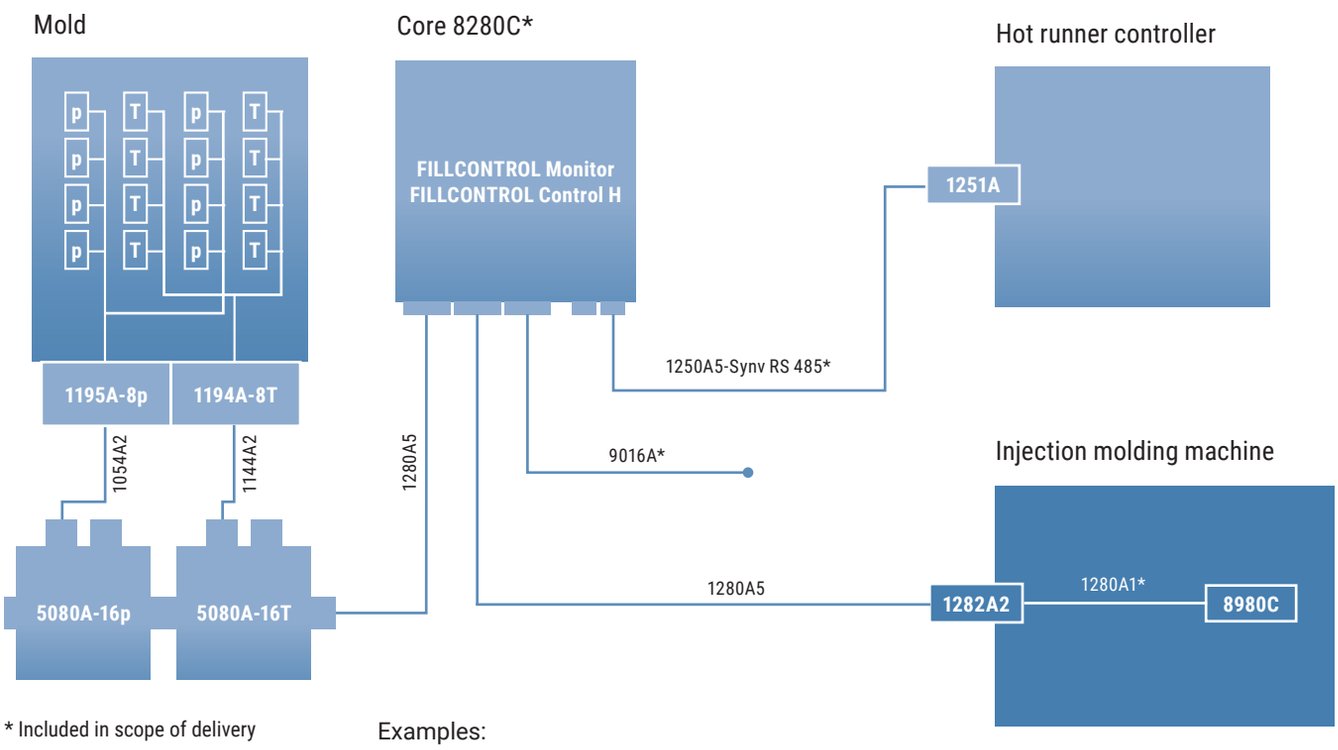
* Included in scope of delivery

Examples:

- Hot runner balancing of a 16-cavity mold with individual bad part separation
- 16 cavity temperature sensors (1 sensor per cavity) for balancing and for process monitoring
- 16 alarm output signals to the robot for the individual separation of each single bad part

Pos.	Quantity	Type	Description
1	1 ×	7080A Control H	Software module for the balancing and control of hot runner molds, incl. BlueLine Core type 8280C, Ethernet connection cable type 1250A-Netst EM15, LED signal lamp type 9023A, mounting for LED signal lamp type 9024A and magnetic mounting for LED signal lamp type 9025A
2	1 ×	7080A Monitor	Software module for monitor and control the injection molding process
3	1 ×	9021A	Fixing device for BlueLine Core type 8280C
4	1 ×	5080A-16T	BlueLine multi-channel amplifier for 16 temperature signals
5	2 ×	1280A5	BlueLine Hybrid Bus connection cable, length: 5 m
6	1 ×	8980C	BlueLine I/O Master, Interface for easy connection of digital alarm and switching signals to the machine respectively to the peripherals
7	3 ×	1282A2	Installation kit incl. control cabinet feed through type 1282A and BlueLine hybrid bus cable type 1280A2
8	16 ×	4004D0.2-101	Miniature cavity temperature sensor
9	2 ×	1194A-8T	BlueLine multi-channel connector box for maximum 8 temperature signals
10	2 ×	1144A2	Multi-pin connector cable (temperature), 8 channels, length: 2 m
11	1 ×	4561B	Mounting / extracting tool for cavity temperature sensors
12	1 ×	9080A	Top hat rail set for the mounting of BlueLine devices
13	1 ×	1280A10	BlueLine hybrid bus connection cable, length: 10 m
14	1 ×	8981A	BlueLine I/O Expander, Add-on interface for interfacing of digital alarm and switching signals of the machine and other peripheral devices
15	2 ×	8982A	BlueLine bus interface for the connection of several BlueLine I/O groups of modules

Order Example 6: FILLCONTROL Control H (2)



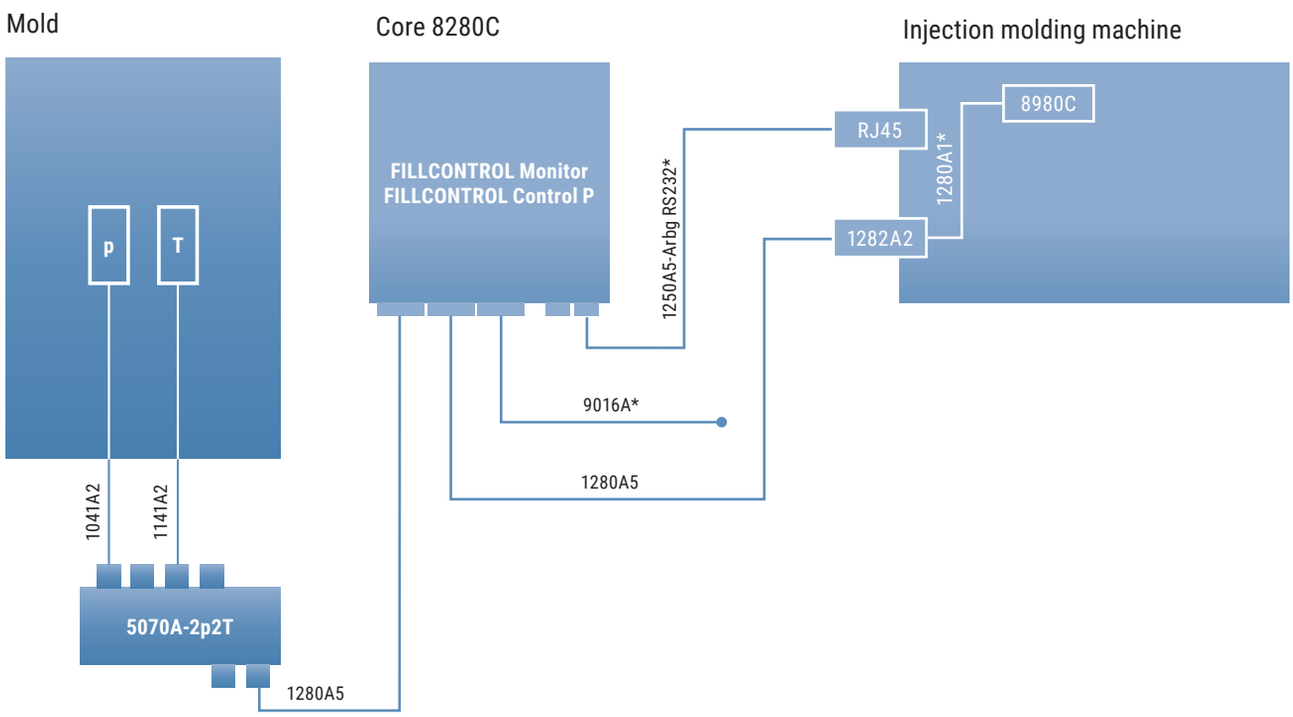
* Included in scope of delivery

Examples:

- Hot runner balancing of a 16-cavity mold
- 1 alarm output signal for the separation of all bad parts
- 16 cavity temperature sensors (1 sensor per cavity) for the balancing and for process monitoring

Pos.	Quantity	Type	Description
1	1 ×	7080A Control H	Software module for the balancing and control of hot runner molds, incl. BlueLine Core type 8280C, connection cable type 1250A-Synv RS485, LED signal lamp type 9023A, mounting for LED signal lamp type 9024A and magnetic mounting for LED signal lamp type 9025A
2	1 ×	7080A Monitor	Software module for monitoring and control of the injection molding process
3	1 ×	9021A	Fixing device for BlueLine Core type 8280C
4	1 ×	5080A-16T	BlueLine multi-channel amplifier for 16 temperature signals
5	1 ×	5080A-16p	BlueLine multi-channel amplifier for 16 pressure signals
6	2 ×	1280A5	BlueLine Hybrid Bus connection cable, length: 5 m
7	1 ×	1194A-8T	BlueLine multi-channel connection box for maximum 8 temperature signals
8	1 ×	1144A2	Multi-pin connection cable (temperature), 8 channels, length: 2 m
9	8 ×	4004D0.2-101	Miniature cavity temperature sensor
10	1 ×	4561B	Mounting / extracting tool for cavity temperature sensors
11	1 ×	1195A-8p	BlueLine multi-channel connector box for maximum 8 pressure signals
12	1 ×	1054B2	Multi-pin connection cable (pressure), 8 channels, length: 2 m
13	8 ×	6008AA0.4-102	Miniature cavity pressure sensor
14	1 ×	6567C	Assembly tool
15	1 ×	6568A	Mounting / extracting tool for cavity pressure sensors
16	1 ×	6585A	Assembling aid
17	1 ×	9080A	Top-hat rail set for the mounting of BlueLine devices
18	1 ×	1282A2	Installation kit incl. control cabinet feed through type 1282A and BlueLine hybrid bus cable type 1280A2
19	1 ×	8980C	BlueLine I/O Master, interface for easy connection of digital alarm and switching signals to the machine respectively to the peripherals
20	1 ×	1251A	Converter RS232-RS485

Order Example 7: FILLCONTROL Control P



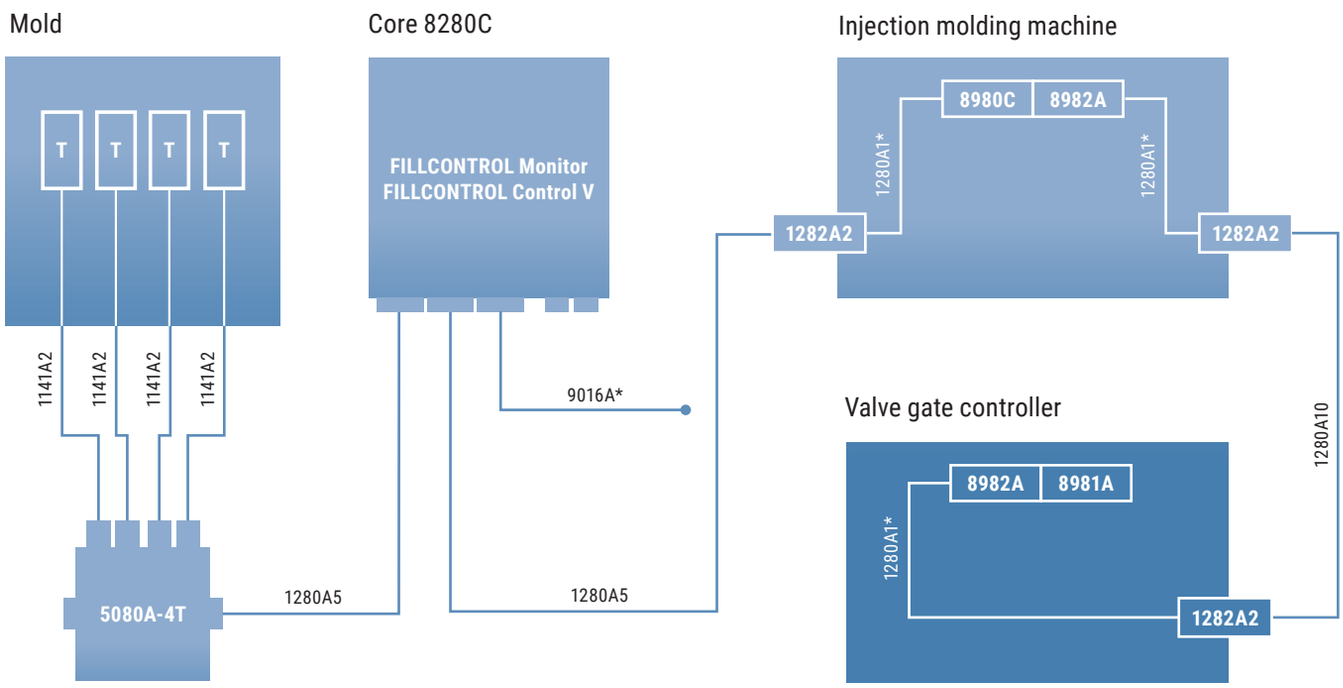
* Included in scope of delivery

Example

- Control of the quality parameters of one large-area part
- Cavity temperature sensor (shear rate, shear stress, mold temperature at 1 bar) Automatic switchover to holding pressure
- 1 cavity pressure sensor (shear rate, shear stress, compression, mold temperature at 1 bar)

Pos.	Quantity	Type	Description
1	1 ×	7080A Control P	Software module for automatic machine control, incl. BlueLine Core type 8280C, connection cable type 1250A5-Arbg RS232, LED signal lamp type 9023A, mounting for LED signal lamp type 9024A and magnetic mounting for LED signal lamp type 9025A
2	1 ×	7080A Monitor	Software module for monitoring and control of the injection molding process
3	1 ×	9021A	Fixing device for BlueLine Core type 8280C
4	1 ×	5070A-2p2T	BlueLine multi-channel amplifier for 2 temperature and 2 pressure signals
5	1 ×	1280A5	BlueLine hybrid bus connection cable, length: 5 m
6	2 ×	1141A2	Connection cable (temperature), length: 2 m
7	1 ×	4004D0.2-101	Miniature cavity temperature sensor
8	1 ×	4561B	Mounting / extracting tool for cavity temperature sensors
9	1 ×	1041A2	Connection cable (pressure), length: 2 m
10	1 ×	6002B0.4-102	Miniature cavity pressure sensor
11	1 ×	6562B	Assembly tool for mounting nuts
12	1 ×	6561A	Mounting / extracting tool for cavity pressure sensors
13	1 ×	8980C	BlueLine I/O Master, interface for easy connection of digital alarm and switching signals to the machine respectively to the peripherals
14	1 ×	1282A2	Installation kit incl. control cabinet feed through type 1282A and BlueLine hybrid bus cable type 1280A2

Order Example 8: FILLCONTROL Control V



* Included in scope of delivery

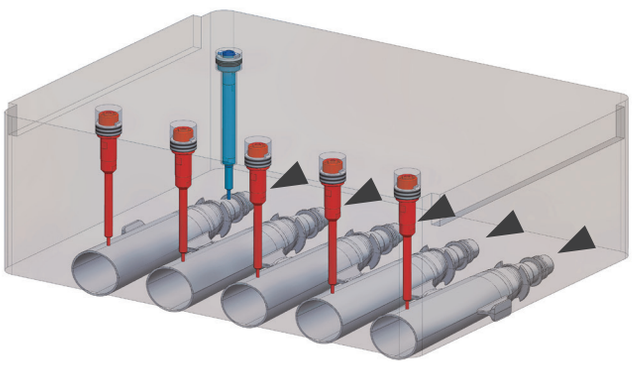
Examples:

- Valve gate control of a 4-cavity LSR mold
- 4 cavity temperature sensors (1 sensor per cavity) for balancing and process monitoring
- Automatically delayed opening of each valve gate

Pos.	Quantity	Type	Description
1	1 ×	7080A Control V	Software module, automatic valve gate nozzle control for balancing and controlling of cold runner molds, incl. BlueLine Core type 8280C, LED signal lamp type 9023A, mounting for LED signal lamp type 9024A and magnetic mounting for LED signal lamp type 9025A
2	1 ×	7080A Monitor	Software module for monitor and control the injection molding process
3	1 ×	9021A	Fixing device for BlueLine Core type 8280C
4	1 ×	5080A-4T	BlueLine multi-channel amplifier for 4 temperature signals
5	2 ×	1280A5	BlueLine hybrid bus connection cable, length: 5 m
6	1 ×	1280A10	BlueLine hybrid bus connection cable, length: 10 m
7	4 ×	1141A2	Connection cable (temperature), length: 2 m
8	4 ×	4004D0.2-101	Miniature cavity temperature sensor
9	1 ×	4561B	Mounting / extracting tool for cavity temperature sensors
10	3 ×	1282A2	Installation kit, consists of: control cabinet feed through type 1282A and BlueLine hybrid bus cable type 1280A2
11	1 ×	8980C	BlueLine I/O Master, interface for easy connection of digital alarm and switching signals to the machine respectively to the peripherals
12	1 ×	8981A	BlueLine I/O Expander, add-on interface for simple interfacing of digital alarm and switching signals of the machine and other peripheral devices
13	2 ×	8982A	BlueLine bus interface for the connection of several BlueLine I/O groups of modules
14	1 ×	9080A	Top hat rail set for the mounting of BlueLine devices

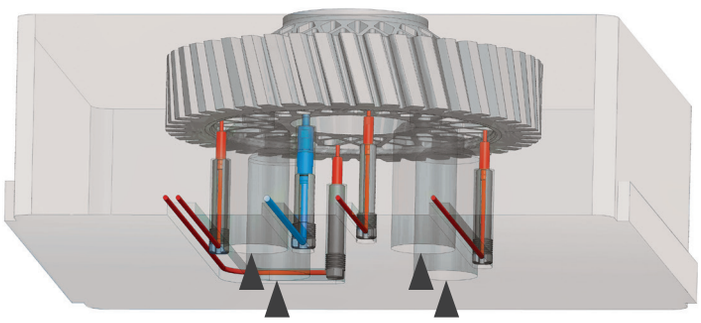
Mounting Examples (Sensor Positioning)

Single-dose containers for eye drobs



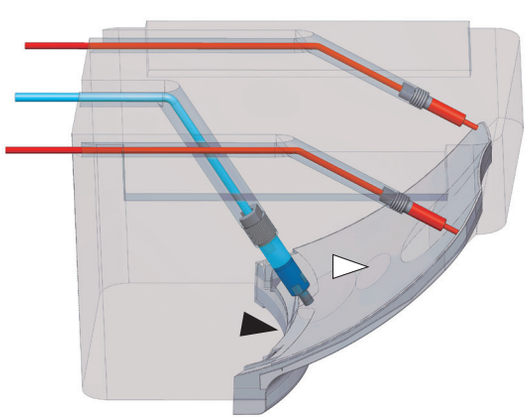
Gate	► Hot runner nozzle
FILLCONTROL module	FILLCONTROL Switch
Sensors	Cavity Pressure Compact Sensors Cavity Temperature Compact Sensors
Functions	Blue: Cavity pressure monitoring Red: Automatic core pull control, fill time monitoring Blue + Red: Viscosity monitoring, process documentation

Worm wheel for steering system



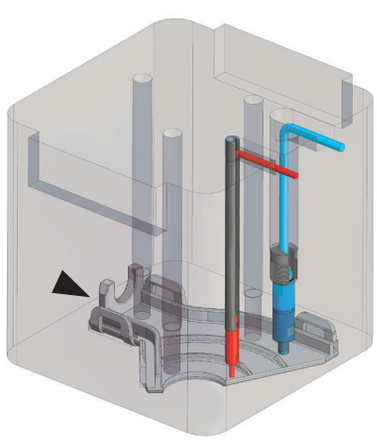
Gate	► Hot runner nozzle
FILLCONTROL module	FILLCONTROL Control H
Sensors	Cavity Pressure Sensors Cavity Temperature Sensors
Functions	Red: Hot runner control, fill time monitoring, automatic switchover Blue + Red: Viscosity monitoring, process documentation

2K handle for pad holder in coffee machine



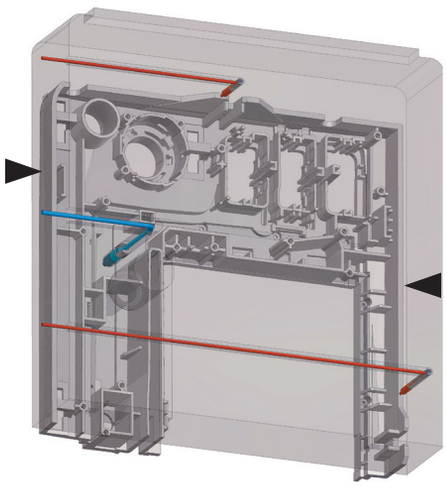
Gates	▷ Hardened component (covered by TPE) ► TPE
FILLCONTROL module	FILLCONTROL Monitor
Sensors	Cavity pressure sensors Cavity temperature sensors
Functions	Blue: Cavity pressure monitoring Red: Fill time monitoring, automatic switchover Blue + Red: Viscosity monitoring, process documentation

Housing cover for central locking system



Gate	► Cold runner nozzle
FILLCONTROL module	FILLCONTROL Monitor
Sensors	Cavity Pressure Sensors Cavity Temperature Sensos
Functions	Blue: Cavity pressure monitoring Red: Fill time monitoring, automatic switchover Blue + Red: Viscosity monitoring, process documentation

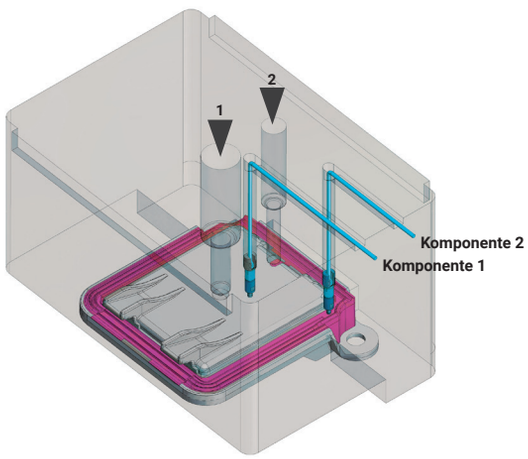
Frontpanel of vehicle GPS system



Gate	► Cold sub-distributor (from hot runner nozzle)
FILLCONTROL module	FILLCONTROL Monitor
Sensors	Cavity pressure sensors Cavity temperature sensors
Functions	Blue: Cavity pressure monitoring Red: Fill time monitoring, automatic switchover Blue + Red: Viscosity monitoring, process documentation

Note:
Partial drawing of part and mold insert for detailed description.

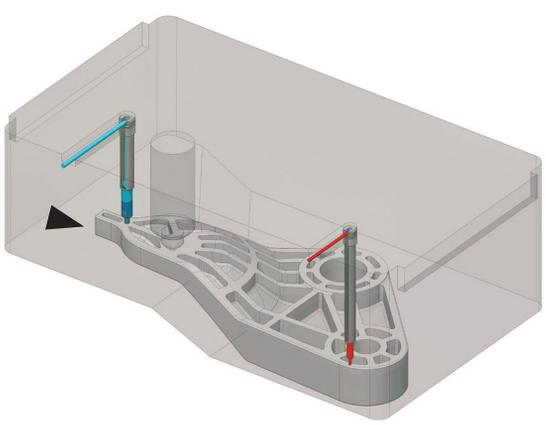
2K cover for housing
1. component: PA66GF30, 2. component: TPE



Gate	► hot runner nozzle
FILLCONTROL module	FILLCONTROL Monitor
Sensors	Cavity pressure sensors Cavity temperature sensors
Functions	Blue: Cavity pressure monitoring and automatic switchover on both components (hard / soft), process documentation

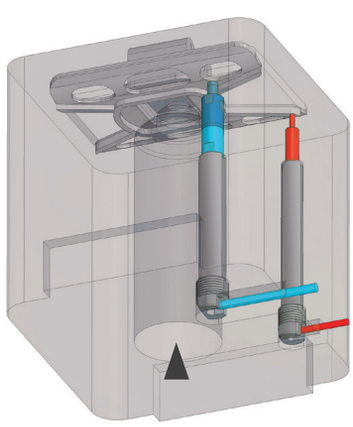
Note
Simultaneous display of the 2k process, this does not reflect the actual situation.

Actuating lever for vehicle locking system

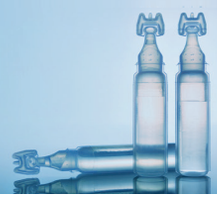


Gate	► Cold sub-distributor (from hot runner nozzle)
FILLCONTROL module	FILLCONTROL Control H
Sensors	Cavity pressure sensors Cavity temperature sensors
Functions	Red: Hot runner control, fill time monitoring, automatic switchover Blue + Red: Viscosity monitoring, process documentation

Cable holder including clip (automotive)



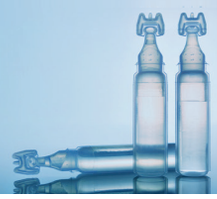
Gate	► Hot runner nozzle
FILLCONTROL module	FILLCONTROL Monitor
Sensors	Cavity pressure sensors Cavity temperature sensors
Functions	Blue: Cavity pressure monitoring Red: Fill time monitoring, automatic switchover Blue + Red: Viscosity monitoring, process documentation



Glossary - Important Terms from Process Technology

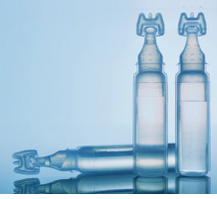
Expression	Definition
Alarm (alarm limit)	An alarm limit is a limit in the domain of the monitoring. An alarm is released, as soon as a monitoring function crossed an alarm limit. An alarm marks the produced part as a bad part, because it does not comply with the required quality characteristics (which are defined by the monitoring limits). Such a part is automatically sorted out. See «Separation of bad parts».
Analog signal	An analog signal is, within the context of the signal theory, a form of a signal with continuous and interruption-free course.
Automatic switchover to holding pressure	The automatic switchover to holding pressure is based on the melt front detection and generates highest stability of injection molding processes, because constant fluctuations of the volumetric filling of the molded parts, dependent from viscosity fluctuations, are recognized and compensated. It is a cavity related, volumetric switchover. Automatic switchover to holding pressure is carried out on the basis of a previously defined signal. More details see «Switchover to holding pressure». The utomatic switchover method is patent protected.
Back pressure (screw back pressure)	The screw back pressure is the pressure against the screw in which it has to work during plasticizing. The material pressure in the cylinder is increased by the back pressure. This is a precondition for a good homogenization and good reproducibility of dispensing. Basically bad flowing materials need a higher pack pressure than easy flowing materials.
BlueLine	Modular hardware of the PRIAMUS FILLCONTROL platform. It provides the amplifier modules type 5080, type 5070, the Core with display type 8280 as well as the I/O modules Master type 8980 and Expander type 8981, Bus Interface type 8982 and the Voltage Input Module type 8983.
BlueLine Amplifier	The BlueLine amplifier type 5080 is a measuring amplifier for cavity pressure and mold wall temperature with 4 or 16 channels each. It is part of the universal PRIAMUS BlueLine data acquisition system for intelligent monitoring and control of the injection molding process. Due to its modularity, the BlueLine Amplifier Type 5080 allows individual configuration of the user system. The BlueLine Amplifier Type 5070 is a measuring amplifier for cavity pressure and cavity temperature with 2 measuring channels for pressure and temperature measurements.
BlueLine Bus Interface	Coupling module between the Top Hat Rail Set and the Hybrid Bus cable for BlueLine devices. The Bus Interface type 8982 is used for connecting an I/O module chain (consisting of an I/O Master and one or several I/O Expanders) to the Hybrid Bus Cable Type 1280.
BlueLine Core	Powerful control device for monitoring, open- and closed-loop-control of the injection molding process according to state-of-the-art. Type 8280 with Touch Screen and integrated FILLCONTROL software.
BlueLine Hybrid Bus Cable	The hybrid bus cable type 1280 is a connection cable for the connection of all BlueLine devices (amplifiers, Core and I/O modules).
BlueLine I/O Expander	Expander module for digital switching signals (inputs / outputs). It transmits control signals from the injection molding machine to the BlueLine system (Input) and receives such signals from this system (Output). The first I/O Expander is directly connected to the I/O Master (via Top Hat Rail Set). You can add additional I/O Expander modules via plug and play via Top Hat Rail Set.
BlueLine I/O Master	The I/O Master type 8980 is a base module for digital switching signals (inputs / outputs). It transmits control signals from the injection molding machine to the BlueLine system (Input) and receives such signals from this system (Output). Depending on your needs, you can connect one or several BlueLine I/O Expanders or Bus Interfaces to the I/O Master.
BlueLine Voltage Input Module	The BlueLine Voltage Input Module type 8983 for the acquisition of 8 analog voltage signals (e. g. 24 V machine signals).
Capability (process capability)	Process capability defines how good a process, respectively, how the results (output) match with the (customer) quality requirement. The shown process capability, respectively, process control charts are used as process documentation. They help the injection molder to draw up his production based on key figures from the cavity. By using this, process fluctuations, thermal balance, shutdowns etc. can be visualized easily and understandably.

Expression	Definition
Cavity Pressure Sensor	PRIAMUS Cavity Pessure Sensors are used for industrial monitoring and controlling of injection molding processes. For decades sensors of this kind and dimension have been used to determine, even during production, the physical properties of a molded part and to adapt them as necessary. The piezoelectric measuring technology has become established for this application over the years, because the sensor itself is especially suitable for this. On account of the partial very fast injection processes, requirements are developed which can only be fulfilled by very compact and stiff sensor designs. PRIAMUS reference in particular to the internal and patented protected developments PRIASAFE™ and PRIASED®.
Cavity temperature	The cavity temperature is (during continuous production) above the mold temperature. The cavity temperature can be measured by, in the cavity (wall) mounted, sensors. The temperature varies because of heating (injection phase) and cooling (back pressure and cooling phase).
Cavity Temperature Sensor	The term «cavity temperature» was created with the founding of PRIAMUS SYSTEM TECHNOLOGIES AG. PRIAMUS Cavity Temperature Sensors have been especially designed to be used in the mold cavity. In this context the reaction time of the sensors play a vital role. Target is to detect the melt front practically in real time. Therefore, the sensor acts as a kind of light barrier in the mold. Furthermore, in this way the temperature profiles of each cavity or special areas of cavities can be analyzed. Therefore, the sensors serve the monitoring and controlling of injection molding process.
Channel	Input connection and / or output connection for a measured variable on the electric device, e.g. the charge signal of a sensor.
Cold runner mold	With coldrunner molds the melt solidifies in the sprue and is separated during or after the demolding of the component.
Communication interface	Communication interfaces are used to read and write actual and set values based on a communication protocol (such as Euromap, SPI or manufacturer specific protocols). This involves for instance injection speed profiles, holding pressure profiles or hotrunner nozzle temperatures. In principle all parameters defined in the protocol may be sent and received. Physically these data are being transmitted for instance to the hotrunner controller or to the host computer of the machine via interfaces such as e. g. RS-232, RS-485 or Ethernet.
Compact Sensor	Many molded parts are not made in the mold platen itself but with the help of mold inserts. This makes it easier to manufacture and maintain the cavities. The use of cavity pressure sensors and cavity temperature sensors is in this case often limited because of the available space. In addition the handling of cables with fixed installed sensors is work intensive during mounting and dismounting of the mold inserts. As a solution PRIAMUS developed Compact Sensors for the pressure and temperature measurement in injection molds. Instead of connecting the sensors by a connection cable with the coupling in the mold insert, the Compact Sensor is tightly connected via a distance sleeve with the coupling. In this way an extremely compact and very easy manageable solution is generated which is available in different dimensions depending on the application. The length of the Compact Sensors is variable and must be specified with the order.
Compression control	The mechanical strength of a molded part depends on the compression of the melt during manufacturing. Depending on the application and the geometry of the molded part, too high compression as well as too low compression may lead to undesired results. In order to reproduce the compression of a molded part, the holding pressure profile of the machine must be adapted. For reproducing this determined and optimized compression initially one single parameter is being optimized. This parameter is adapted by the holding pressure profile of the molding machine until the optimized compression in the cavity finally is achieved.
Compression injection molding	The injection-compression is an injection molding process for the production of high precision or big components of plastic. Thereby the plastic melt is injected in the practically unpressured, not completely closed, mold. The mold is only completely closed during the solidification process. The thereby corresponding, steadily closing pressure guarantees the final molding of the component. By the help of the automatically detected melt front, the stamping process is initiated in relation to the volumetrical filling.
Core	See «BlueLine Core».
Core pull (technology)	The core pull is a component of the injection molding machine. The core pull is a plunger (different designs) which can be retracted and extended in the cavity to enable a corresponding volume during the injection or to demould specific sectors. The controlling of core pulls is triggered by melt front detection. The core is always controlled at the same volumetrically full degree and not traditional via time, with the consequence of different melt positions.
Core pull control	The core pull control is a component of the injection molding machine to control the core pulls.
Digital signal	A digital signal is a map of an analog signal in time-discrete and value-discrete form.



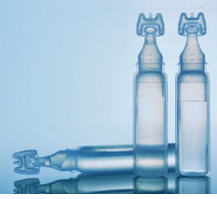
Expression	Definition
Ejector pin	The ejector pin is a component of the mold and serves the demolding of the molded parts. Note: There are also other demolding units such as stripper plates.
Event log	FILLCONTROL Event Log is displaying all messages generated by the system. Thereby the user is being continuously informed about the state of the system, in order to control and adapt those in an optimal way.
FILLCONTROL	FILLCONTROL is the central data acquisition, evaluation and control software for all PRIAMUS applications. The FILLCONTROL software provides the user interface for PRIAMUS measuring devices.
FILLCONTROL FreeViewer	FILLCONTROL FreeViewer type 7080 is a free of charge software module for the display and analysis of FILLCONTROL measuring data.
FILLCONTROL Measure	FILLCONTROL Measure type 7080 is a free of charge software module for simple data acquisition and process documentation with BlueLine amplifiers.
FILLCONTROL Monitor	FILLCONTROL Monitor type 7080 is a software module for individual monitoring and control of the injection molding process to be used together with the BlueLine Core type 8280.
FILLCONTROL Switch	FILLCONTROL Switch type 7080 is a software module for the controlling of injection molding processes as well as special switching and monitoring processes, for example in rotary table applications or in sequential injection molding.
FILLCONTROL Control H	FILLCONTROL Control H type 7080 is a software module for the balancing and controlling of hot runner molds, including BlueLine Core type 8280 and communicating cable.
FILLCONTROL Control P	FILLCONTROL Control P type 7080 is a software module for the controlling of shear stress, shear rate, compression and shrinkage via host computer interface of the injection molding machine, including BlueLine Core type 8280 and communicating cable.
FILLCONTROL Control V	FILLCONTROL Control V type 7080 is a software module for the balancing and controlling of the melt flow especially of cold runner molds (LSR). Thereby the opening times of the valve gate nozzles are automatically delayed, including BlueLine Core type 8280.
Fill time control	On this control operation mode the melt flow is controlled on a reference state. This issue of time is fixed by the set fill time [period] in [s] at the beginning of each cycle. This fill time control can be carried out by nozzle temperatures as well as by the control of valve gate nozzles.
Flow path	The flow path is the distance the melt needs to pass until the cavity is filled.
Flowpath-wall section ratio	Relation between longest flow path of the mold, measured from the gate to the end of the flow path, divided by average wall thickness on this distance.
Force shunt	An improper installation of a pressure sensor (contact of measuring element with wall of the bore) produces a force shunt. This force shunt effects a loss of sensitivity of the sensor. The measurement will be distorted. Such an error may be up to 30 %. The smaller a sensor, the larger the influence. Each pressure measurement without PRIASAFE™ technology is therefore dependent on the installed conditions of the sensor. For that reason, the measurement without PRIASAFE™ technology is not necessarily reproducible and trustworthy.
Hardware interface	Hardware interfaces are designed to transmit status information at certain events (e. g. „valve gate open“, „automatic switchover to holding pressure“ or „separate reject part“). These events may be transmitted from the PRIAMUS system to a machine, a robot or a peripheral device, as well as in the opposite direction. Physically and typically this involves a voltage level (e. g. 0 V / 24 V) which represents the logic status „0“ and „1“. In the future this will also be possible fully digital via a real time bus.
Holding pressure	After injection the machine switches to holding pressure. The holding pressure and the holding pressure time should compensate the volume contraction during the solidification of the melt as much as possible.
Holding pressure level	Many machines offer up to ten holding pressure levels. In the case of thin-walled components, for example, a short high holding pressure level is followed by a lower holding pressure to avoid too high tensions near the gate.

Expression	Definition
Host computer interface	The interface of the host computer serves the communication with the single components of a machine and is needed for PRIAMUS controlling with FILLCONTROL Control H / Control P.
Hot runner balancing	FILLCONTROL Control H can be operated in hot runner balancing mode. On this control operation mode for multi cavity molds all cavities should be filled simultaneously, i.e. different volumetrical degrees of filling in the cavities are balanced until a balanced state predominates. This module can be used for pure hot runner manifold applications as well as for sub-contributor with hot-to-cold applications.
Hor runner control	By the use of hot runner control the melt flow of hot runner molds is controlled.
Hot runner control device	The hot runner control device controls the temperature of hot runner manifold and hot runner nozzles and influences therefore the melt flow in hot runner molds.
Hot runner manifold	The hot runner manifold is a component of the hot runner gating system. The hot runner manifold serves the distribution of the melt to the single cavities.
Hot runner mold	See «Hot Runner System».
Hot runner nozzle	The hot runner nozzle forms the transition between heated and unheated zone in a mold of an injection molding machine. The hot runner ends in the tip of the hot runner nozzle. Each nozzle features differences in sensitivities for heating and cooling processes.
Hot runner system	The hot runner / hot runner system is a special design of the gating system in the processing of plastics. The gating system is thermally isolated and higher tempered in contrast to the remaining mold. Because of this, the plastic in the sprue stays constantly flowable. No sprue stays at the component.
Hybrid Bus Cable	See «BlueLine Hybrid Bus Cable».
Indirect pressure measurement	The indirect pressure measurement is mainly used where no sensor for direct measurement can be placed due to design reasons or where the witness of a sensor mark is not acceptable. This measurement is affected by friction (dependent on pin diameter) and may change over time due to deposits (abrasion).
Individual separation of bad parts	Individual separation of bad parts assumes recognizing and differentiating of good parts and bad parts. Not the entire shot is separated, only the cavities of the bad parts. In this case the interface I/O Expander type 8981 is being installed at the corresponding handling.
Injection speed	Screw advance speed inside of the injection unit during the injection phase. The injection rate is regarded as the control value to influence the share rate [1/sec] of the molded part.
Injection speed steps	Length sections during the injection with different screw rates. Usually, at least 2 injection speed steps are used. The second step will drive through briefly and at a deeper injection speed to prevent overmolding with the switchover to holding pressure.
Integral	The integral shows the area under the corresponding measurement graph. The integral can be used as a monitoring function and can be time limited. For example, the integral of the pressure graph during the injection phase or the integral of temperature graph during the cooling phase are used as monitoring functions.
Intervention (action limit)	An action limit is a limit in the domain of the monitoring. An action signal is released, as soon as a monitoring function exceeds or drops below the action limit. The produced part is still a good part. The tolerances of the action limits are contained within the alarm limits. This function should be used to recognize a drifting process on time, to react before the alarm limits are crossed.
Liquid silicone rubber (LSR)	Liquid silicones are elastomers consisting of two components. The components are mixed directly before injection.
Machine barrel cylinder	The machine barrel is a central component of the injection molding machine. The screw is moving inside the machine barrel. More detailed information see «Screw».



Expression	Definition
Machine control	The machine control assumes the monitoring and analysis of machine data. By continuously monitoring and correcting the parameters the production process is stabilized and a maximum production efficiency is achieved.
Machine interface	The machine interface serves the communication and is an interface between physical systems.
Machine nozzle	The machine nozzle forms the end of the injection unit at the machine barrel. The machine nozzle serves the transfer of the melt from the injection molding machine to the mold.
Maximum	FILLCONTROL monitoring criteria «Maximum value».
Melt flow	The melt flow over a specific distance is defined by the share rate. The controlling of the viscosity of plastic melt with FILLCONTROL bases on the calculating relationship shear stress / shear rate. A too high viscosity can be reduced by increasing of shear rate (or reducing shear stress). A too low viscosity can be increased by reducing of shear rate (or increasing shear stress).
Melt position	Position of the melt inside the cavity. PRIAMUS is able to detect the melt position.
Melt temperature	The melt temperature is generally defined as the average temperature of melt volume, in the collecting chamber between the nozzle and the tip of the screw, which is provided for the next shot.
Melt Temperature Sensor	A melt temperature sensor determines the melt temperature. See «Melt temperature».
Minimum	FILLCONTROL monitoring criteria «Minimum value».
Mold temperature	The mold temperature for each plastic material is indicated in a range and is a compromise between cost-effective production and optimum structural properties.
Online control	The controlling of a process is when an interaction takes place in which a principle variable (dynamic) size is kept automatically constant or roughly constant. Characteristics for the controlling of injection molding processes: The influence of the controlling must be measured directly at the molded part. Only then it is possible to speak from a closed control loop.
Part dimension	Dimension of the component after the demolding and shrinking (1 to 3 days after demolding according to the plastic type and wall thickness). On account of the shrinking the part dimension is smaller than the dimension in the mold.
Quick Disconnect	Quick Disconnects make installing and removing of the tool inserts simple, quick and safe by the separation of the connection cable.
Quick Disconnect Cable	The Quick Disconnect Cable is mounted in the mold platen and establishes the connection between the compact sensor, or sensor with quick disconnect, to the connection cable or multi-channel connector box.
Piezoelectric signal	A sensor with a piezoelectric measuring element yields an electrical charge during mechanical deformation or under pressure. This electrical charge corresponds to the piezoelectric signal. By the indication of the sensitivity of each single sensor [pC/bar] the values of charge can be converted to pressure values and displayed as a cavity pressure curve.
PRIAFIT®	The PRIAFIT® mounting sleeve for cavity pressure and cavity temperature sensors consists of a combination of mounting nut and distance sleeve and combines the advantages of both methods. The thread for the mounting of the sensor can easily be tapped near the borehole top and the length of the sleeve must not be cut exact but only approximate. A simple but very efficient and cost-saving method.
PRIASAFE™	PRIAMUS procedure for safe mounting of cavity pressure sensors. These sensors are protected by a casing and a force shunt (after calibration) is avoided. Only this concept guarantees a reproducible measurement of pressure even after mold service.
PRIASED®	PRIAMUS procedure for automatic sensor and sensitivity detection. Thereby the sensitivity is identified and processed by a built-in hardware code inside the sensor.

Expression	Definition
Process capability	See «Capability».
Process control	The process control is an approach for the automatic optimization of production processes.
Process fluctuation	A process is always subject to process fluctuations. The lower the process fluctuations are, the better the process is. By the monitoring and controlling functions of FILLCONTROL, process fluctuations are timely recognized, analyzed and minimized.
Process monitoring	Process monitoring is a method of monitoring of production processes based on statistical procedures.
Real-time control	In contrast to online control this control refers to an open control loop, this means that no information is flowing back.
Rotary table	There is a great variety of rotary table constructions. They are used for multi-component injection molding or for injection molding parts with inserted components. Mold halves, for example, are displaced by a rotary table and the injection molding process is continued further on. Particularity of process monitoring and process controlling: The measuring channels and monitoring functions must be assigned to the corresponding rotary table position. Furthermore good and bad part signals might need to be sent delayed by x cycles.
Screw	The screw is located inside the plasticizing unit and has the following functions: absorbing granulate from hopper, conveying, compressing, melting, homogenizing and injecting.
Screw position	The screw position, as well as the injection rate and the injection pressure, belong to the controlled injection molding machine parameters.
Screw stroke	Screw stroke during various production phases.
Separation of bad parts	Separation of bad parts assumes recognizing and differentiating of good parts and bad parts. A good, respectively, bad part signal is transmitted above a standardized interface to the machine, respectively, to the robot (to the part separation), see als «Alarm».
Sequential injection molding	Sequential injection molding is a special kind of sequential valve gate closing. The optimal filling of a component can be carried out with the valve gate control, through individual opening of the valve gate nozzles in a graded sequence (based on melt front detection). A sequence running of the melt front is thereby generated from section to section.
Shear rate control	The shear rate of a plastic melt depends on the geometry of the cavity and on the adjusted injection speed of the molding machine. Basically two sensors are required to determine shear rate by which the arrival of the melt front is automatically detected at the sensor position. On principle two pressure sensors, two temperature sensors or one of each (pressure or temperature) could be used. The determined shear rate can be reproduced at any time on the same or on another machine by varying and adapting the injection speed profile accordingly. The flow conditions are therefore always the same.
Shear stress control	Shear stress is determined during injection and depends, first of all, on the fill pressure during the filling stage. For this reason the beginning of the pressure rise and the moment of pressure detection are automatically determined and analyzed. In order to control the shear stress the melt temperatures must be changed. This is done by changing the barrel temperature and, with hot runner molds, additionally changing the hot runner temperatures. The shear stress is often used when concerned about surface quality. Only via this value it is possible to make a statement regarding the reproducibility of a surface property.
Shrinkage	See «Part dimension» and «Shrinkage control».
Shrinkage control	Shrinkage control with FILLCONTROL Control P. A molded part starts to shrink in the injection process when atmospheric pressure is reached by cooling of the melt. If these parameters change during the process also the shrinkage of the parts (parts dimension) will change. The shrinkage control of the FILLCONTROL system determines the cavity temperature when reaching atmospheric pressure (or a certain residual pressure) and controls existing deviations automatically. The system controls the temperature controllers preferably via main computer interface of the machine.
Standard deviation	The standard deviation is a term of the statistics and probability calculation. The standard deviation is a measure of the dispersion of the values of random variables around the expectation.



Expression	Definition
Switchover to holding pressure	While switching from injection pressure to holding pressure the machine is switching from the speed-controlled injection phase, in which the cavities are filled, to the pressure-controlled holding pressure phase, in which the shrinkage of the material is compensated. Ideally this switchover occurs exactly when the cavity is nearly filled volumetrically.
Temperature control unit	A temperature control unit is a device (as a part of a production plant) that carries out the tempering of a medium for the production process (mold).
Thermocouple	A thermocouple converts heat into electric energy (thermoelectricity). It is a component made of two different metals connected with each other at one end. A temperature difference generates an electric tension by the heat flow. PRIAMUS uses thermocouples Type N which offer certain advantages in contrast to thermocouples Type J and Type K.
Thermoplastic (Plastomere)	Thermoplastics (plastomers) are plastics which can be deformed in a certain temperature range (thermo-plastically). This process is reversible, i.e. it can be repeated any number of times by cooling down and rewarming up to the melted state, unless the so-called thermic decomposition takes place by excessive heating and / or shear.
Thermosets	Thermosets are plastics which can no longer be molded after solidifying. Thermosets are hard, glass-like polymer materials that are linked in a rigid 3-D structure by chemical primary valency bonds.
Traceability	Traceability is a term of measuring technology and analytical chemistry and describes a characteristic of measurement results. For traceable measured values applies: Each measured result can be referenced to national or international norms by a continuous line of comparative measurements with indicated measurement uncertainties.
Validation	Validation is the proof for repeatability of a result from a described approach under defined conditions. Machine parameters are used for the classical injection molding validation. Nevertheless, PRIAMUS uses the measuring data from the cavities. Only then is it possible to speak about process validation. Only if the process is repeatable, a constant part quality can be assumed.
Valve gate	Machines valve gates are used where dropping of melt or stringing of mostly low-viscosity materials should be prevented.
Valve gate control	The valve gate control controls (for example by pressure) the opening and closing of the valve gate(s). An automatic calculation of these switching processes (valve gate control) was realized with FILLCONTROL Control V.
Viscosity	The viscosity of a melt is a measure of the inner flow resistance. The viscosity is calculated from the quotient of the shear stress and shear rate and can be measured, monitored and controlled by Cavity Pressure Sensors and Cavity Temperature Sensors. Viscosity differences affect fluctuations in the process with the result of quality differences in the production.
Voltage signal	A voltage describes the difference of electric potentials (different electric load). Injection machines deliver different status signals in the form of analog voltages. These signals can be analyzed, compared with measured data from cavities and monitored by help of FILLCONTROL.
Volumentric Filing	The volumetric filling is reached when the cavity is filled. Before reaching of the volumetric filling (approx. 95 – 98 %) the switchover from injection pressure (injection rate) to holding pressure is carried out.
Warning	A warning limit is a limit in the domain of the monitoring. A warning signal is released, as soon as a monitoring function exceeds the warning limit. The produced part is still a good part. The tolerance of the warning limits are contained within the action limits. A warning signal can be seen as the first sign of a drifting process.

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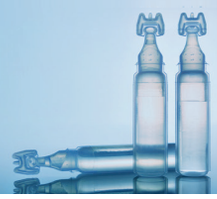

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EP 1 373 999, US 6 968 240, JP 4 256 164, EP 1 372 934, US 7 597 827, JP 4 690 637, EP 1 377 427, JP 4 155 826, US 7 431 871, EP 1 372 933, EP 1 381 829, US 7 071 712, JP 4 726 393, US 7 682 535, EP 1 381 502, JP 4 278 986, DE 102 58 100.2, EP 1 575 753, JP 4 177 333, KR 01059636, DE 102 61 498.9-09, JP 4 895 820, US 7 430 923, KR 10-1124939, EP 1 695 057, EP 1 714 127, US 7 644 620, KR 10-1202593, JP 4 889 632, EP 1 761 375, KR 10-1202593, US 7 476 095, JP 4 767 955, DE 10 2005 005 850.7, US 7 931 837, JP 4 987 859, KR 10-1442247, EP 1 888 316, JP 4 987 859, KR 10-1442247, EP 2 212 086, US 8 329 075, JP 5 153 877, KR 10-1529973, DE 20 2008 014 027.7, DE 20 2007 008 390.4, EP 2 485 881, DE 102 011 054 278.7, CN 201 480 .63 965.3, DE102 011 051 200.4, DE 102 014 100 950.9, DE 102 014 114 874.6, CN 201 480 063 965.3, EP 14 818 890.7, JP 516 151 003, KR 2016-7016051, US 15/038537

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690 637, EP 1 377 427, JP 4 155 826, US 7 431 871, EP 1 372 933, EP 1 381
829, US 7 071 712, JP 4 726 393, US 7 682 535, EP 1 381 502, JP 4 278 986,
102 58 100.2, EP 1 575 753, JP 4 177 333, KR 01059636, DE 102 61 498.9-0
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