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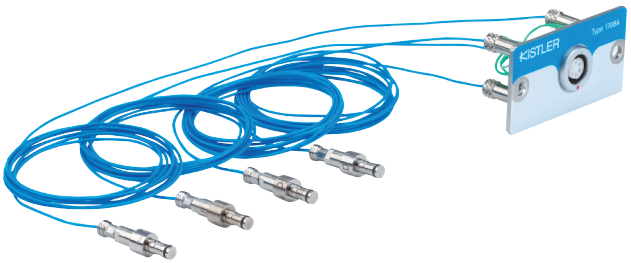
Multi Sensor Set

Type 6831B...

Sensors and multichannel Connectors for Mold Cavity Pressure Measurement

Modular system for injection molding, multi-channel applications or in multi-cavity injection molds. It consists of cavity pressure sensors with Unisens® sensitivity and a four-channel or eight-channel multi-pin connector. All sensors are equipped with the single-wire technique.

- Simplified connection of up to 16 sensors, using single-wire technique
- Compact multi-channel connector for up to four or eight sensors
- Use of 4-channel or 8-channel extension cables
- Unisens sensitivity of all sensors



Description

The choice of sensors with single-wire cable available for this set are the standard direct measuring Types 6152A..., 6155A..., 6157B..., 6159A..., 6167A..., 6182B..., 6183A... und 6184AA... as well as the highly sensitive sensor Types 6172AA..., 6177AA... and 6178A... . Also available are the indirect measuring sensor Types 9204B..., 9210AA..., 9211B... and 9213B... . The set includes the multi-channel connector Type 1708A... and 1710A...

The pressure acts directly over the entire front of the sensor and is transmitted to the quartz or crystal measuring cell, which produces a proportional electrical charge. All sensor parts are corrosion-resistant. The sensitivity (charge per pressure or pC/bar) is the same for all sensors (Unisens technology) at system and needs to be entered only once in the process monitoring system (e.g. CoMo Injection or DataFlow system).

The small cross-sectional area of the sensor cable allows flexibility of installation. In the single-wire technology, electrical shielding is guaranteed by the mold. The open cable end is secured to the back of the multi-channel connector using cut-and-grip contact, thus dispensing with the need for a single-channel conventional connector Type 1839. The length of the connecting cable can be cut to length by the customer according to the size of the mold.

Two types of multi-channel connectors are available for the Multi Sensor Set. A 4-channel connector allows the connection of up to four sensors. The 8-channel connector is designed for the connection of up to eight sensors.

Selection of the appropriate multi-channel connector can thus be determined by the grouping of the cavities. In the case of a mold with eight cavities, two 4-channel connectors can be fitted, i.e. one on each side.

Technical Data

Multi Sensor Set Type 6831B...

		Type 1708A0	Type 1710A0
Number of channels	–	1 ... 4	1 ... 8
Mounting	–	in the mold	in the mold
Mounting dimensions (LxWxD)	mm	52x28x26	68x28x26
Connector type for extension	–	Fischer 103	Fischer 104
Mold temperature	°C	200	200

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Application

The Multi Sensor Set is designed for industrial use in multi-cavity molds. The multi-channel connectors Type 1708A… and 1710A… save space in the mold, and the simplified connection technique reduces the time needed to install the multi-channel extension cables Types 1995A… and 1997A…

Another very useful application is the equipping of large single or two-cavity molds, in which the pressure curve is to be measured at several locations in one cavity, e.g. for process control in sequential injection molding. The Multi Sensor Set, with the single-wire technology and the multi-channel connector, allows simple mold design for up to eight sensors with a central cable connection.

This simplifies and standardizes the connection to quality monitoring systems like the CoMo Injection or DataFlow systems. The hazards of a potential mix-up can be excluded when connecting the sensors to the CoMo Injection.
The Multi Sensor Set can also be operated with the conventional machine-integrated charge amplifiers Type 5155A… and with the DataFlow monitoring system Types 2853A…, 2859A… and 2865A… . An adapter cable Type 1999A1A… is provided to ensure compatibility with this type of installation.

When the new 4-channel charge amplifier plug-in unit Type 5063A2 is used in Types 2853A..., 2859A... and 2865A..., the 4-channel extension cable Type 1995A… can also be connected directly.

The measuring range and the operating temperature range are dependent on the type of basic sensor and can be taken from the corresponding data sheet.

Fig. 1: 4-channel connector Type 1708A… for connecting up to four sensors

Fig. 2: 8-channel connector Type 1710A… for connecting up to eight sensors

Mounting

The sensor is secured in the mounting hole with the spacer sleeve. A mounting nut can also be used for this purpose. Mounting with the spacer sleeve is mainly recommended for the smaller sensors with a front diameter of 2,5 mm and 1 mm (Types 6178A…, 6182B… and 6183A…). The front of the sensor forms part of the cavity wall and therefore fits flush with the wall. For indirect measuring sensor Types 9210AA... and 9211B the pressure disk must be used. Details of the selected sensors can be seen in the specific data sheets.

The single-wire cable must be dressed into the mold and the multi-channel connector must be mounted directly in the mold. In order to provide adequate protection, the connector should be let into the wall of the mold (see mounting illustration).

The single-wire cables of the cavity pressure sensors are tightened by hand directly into the cut-and-grip contacts behind the multi-channel connector. The cable can be cut to length as appropriate for the mold dimensions.

Detailed recommendations on mounting are contained in the document "Important Notes for the Multi Sensor Set" Doc. No. 002-330e. This is contained in the accessories included.

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Mold Cavity Pressure Sensors

Only single-wire sensors are used for the Multi Sensor Set. The technical data along with the supplementary mounting instructions for the single-wire sensors are contained in the appropriate data sheet for the standard type of sensor. Direct mounting of the single-wire cables with the multi-channel connector is a requisite for the multi-channel system; this connector can then be connected via a corresponding multi-channel extension cable to the CoMo Injection Type 2869 monitoring unit or the DataFlow system Types 2853A…, 2859A… and 2865A… .

For this reason, the included accessories for the Multi Sensor Set do not contain the connector (Type 1839) or the mounting plate (Art. No. 3.520.328) listed in the data sheet for the basic type of sensor.

When selecting indirect measuring sensor Types 9204B..., 9210AA..., 9211B… or 9213B… – the surface area of the ejector pin must be considered to check the maximum sensor force. Refer to the particular data sheet for further details. The CoMo Injection then uses ejector pin data to calculate the actual sensor sensitivity.

Processing of Measured Data

The following systems are available for automatic processing of the measured data. The relevant data sheets are listed:

- CoMo Injection Type 2869... for process monitoring
- Quality monitoring platform compact SCP Type 2865...
- Pico signal conditioner portable measuring system Type 2859A…
- Sico SCP for plastic processing Type 2853A...

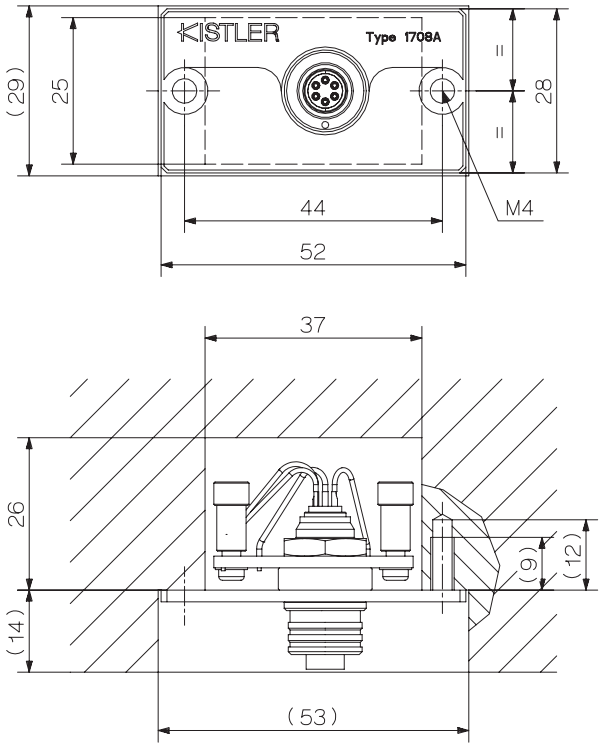

Fig. 3: Mounting dimensions for 4-channel connector Type 1708A…

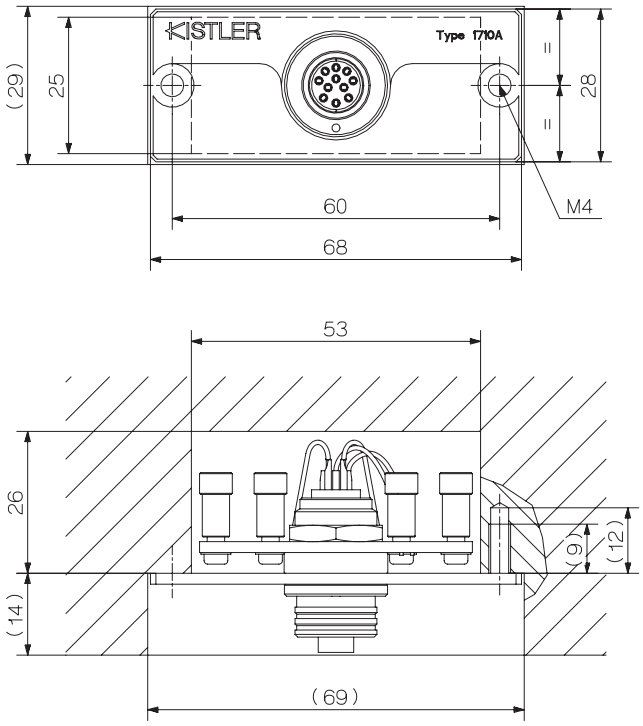

Fig. 4: Mounting dimensions for 8-channel connector Type 1710A…

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Spare Parts
Sensors and cables must be ordered individually as spare parts. For sensor Types 6152A..., 6157B..., the spare cable of 1,5 m length is the Type 1666A1, the spare cable of 5 m length is the Type 1666A3.
For the sensors Type 6159A..., 6167A..., 6172A..., 6177A... and for Type 9204B... 9211B…, and 9213B… the spare cable of 1,5 m length is the Type 1666A2 and with 5 m cable the Type 1666A4 is used.

Sensor Types 6155A…, 6178A…, 6182B..., 6183A..., 6184AA... and 9210AA... are supplied with integral cable. When reordering these sensors, the average sensitivity or serial number of the system Type 6831B... must be stated.

Scope of Delivery with Included Accessories	**Type/Art. No.**
Sensors, type and quantity according to order	
• Cables, length 1,5 m for Types:	
• 6152A…, 6157B…	1666A1
• 6159A…, 6167A…, 6172A..., 6177A... 9204B…, 9211B..., 9213B…	1666A2
• 6155A..., 6178A..., 6182B..., 6183A..., 6184AA..., 9210AA... (with integrated cable)	None
Mounting nut for Types:	
• 6152A…, 6172A…	6453
• 6157B…, 6159A…, 6167A…, 6177A…	6457
• 6184AA...	6465
Spacer sleeve only for Types:	
• 6178A…, 6182B…, 6183A…	6464A1
• 6184AA...	6466
Checking tool only for Types:	
• 6178A…, 6182B…	3.050.243
• 6183A...	3.050.241
• 6184AA...	1365
Thrust washer	
• 9211B...	9411
• 9210AA...	9406
• 6184AA...	6470
• 4-channel connector with Fischer 103	1708A0
• Coding plate (red) for Type 1708A0	3.520.1037
or	
• 8-channel connector with Fischer 104	1710A0
• Coding plate (red) Type 1710A0	3.520.1101
• Marker set to number the sensor cable	5.210.592
• Identification plate with sensor sensitivity	3.520.1027

Scope of Delivery with Included Accessories	**Type/Art. No.**
• Document "Important Notes for the Multi Sensor Set"	002-330

Note
Cables, mounting nuts, spacer sleeves and checking tools are supplied according to the number of sensors ordered.

Optional Accessories	**Type**
4-channel extension cable for Type 1708A… (max. 4 sensors) Connector 6-pin pos. to connector 6-pin neg.	
• Length 1 m	1995A1
• Length 2 m	1995A2
• Length 5 m	1995A5
• Length customer-specific (L_{min} = 0,3 m/L_{max} = 10 m)	1995Asp
8-channel extension cable for Type 1710A… (max. 8 sensors) Connector 11-pin pos. to connector 11-pin neg.	
• Length 1 m	1997A1
• Length 2 m	1997A2
• Length 5 m	1997A5
• Length customer-specific (L_{min} = 0,3 m/L_{max} = 10 m)	1997Asp
Adapter cable for Type 1708A… 4 BNC connectors for charge amplifier Type 5155, Pico Type 2859 or Compact-SCP Type 2865, Connector 6-pin pos. to 4 x BNC neg.	
• Length 0,5 m	1999A1A0,5
• Length 2 m	1999A1A2
• Length 5 m	1999A1A5
• Length customer-specific (L_{min} = 0,6 m/L_{max} = 10 m)	1999A1Asp
Adapter cable for Type 1710A… 8 BNC connectors for Pico Type 2859 or Compact-SCP Type 2865, Connector 11-pin pos. to 8 x BNC neg.	
• Length 0,5 m	1999A2A0,5
• Length customer-specific (L_{min} = 0,6 m/L_{max} = 10 m)	1999A2Asp

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Ordering Key

Type 6831B ☐ E ☐ ☐ ☐

Sensor Standard Type*

Direct measuring

Type 6152AAG	**01**
Type 6152AAAG	**02**
Type 6152ACG	**03**
Type 6152ACAG	**04**
Type 6155AG	**05**
Type 6157BAG	**06**
Type 6157BCG	**07**
Type 6159AG	**08**
Type 6159AU6G	**09**
Type 6167AG	**10**
Type 6172AAG	**11**
Type 6177AAG	**12**
Type 6178AG	**13**
Type 6182BG	**14**
Type 6182BCG	**15**
Type 6183AG	**16**
Type 6183ACG	**17**
Type 6184AAG	**18**

Indirect measuring

Type 9211BG	**31**
Type 9213BG	**32**
Type 9210AAG	**33**
Type 9204BG	**34**

* For the Multi Sensor Set, the single-wire version is supplied.

Number of Sensors

Number of sensors	**02 … 16**

Multi-Channel Connectors

4-channel (Type 1708A0)	**A**
8-channel (Type 1710A0)	**B**
No connector	**Z**

Number of connectors	**0 … 4**

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