Series CST-CSV-CSH, CSB-CSC-CSD magnetic proximity switches

Reed
Magnetoresistive - Hall effect (Series CST, CSV, CSH only)

- Series CST, CSV, CSH: integrated into actuators profile, with or without M8 connector
- Series CSB: for CGA-CGP-CGC grippers
- Series CSC: for CGLN grippers
- Series CSD: for CGSN-CGPT-CGPS-RPGB grippers

The switches are available in two different versions - Reed with mechanical switching and with electronic switching - and they are subdivided into Hall effect and Magnetoresistive. The electronic versions are suggested for heavy duty with frequent operations and strong vibrations.

The magnetic proximity switches define the position of the cylinder piston. When the internal contact is actuated by a magnetic field, the sensors complete an electrical circuit and provide an output signal to actuate directly a solenoid valve or a PLC. A yellow or led LED diode shows when the internal magnetic contact is closed.

GENERAL DATA

	Series CST, CSV, CSH	Series CSB, CSC, CSD
Operation	Reed contact Magnetoresistive Hall effect	Reed contact (CSB, CSC only) Magnetoresistive (CSD only)
Type of output	Static or electronic PNP	
Type of contact in Reed switches	Normally Open (NO), Normally Closed (NC)	Normally Open (NO)
Voltage	see the characteristics of each model	see the characteristics of each model
Max current	see the characteristics of each model	see the characteristics of each model
Max load	8 W DC and 10 VA AC (Reed) 6 W DC (Magnetoresistive - Hall effect)	8 W DC and 10 VA AC 6 W DC (Magnetoresistive)
Protection class	IP67	IP66
Materials	plastic body encapsulating epoxy resin; cable in PVC, connector in PVR, connector body in PU	plastic body encapsulating epoxy resin
Mounting	directly into the groove or by means of adapters	directly into the groove
Signalling	by means of a yellow diode Led	by means of a red Led
Protections	see the characteristics of each model	see the characteristics of each model
Switching time	<1,8 ms (Reed) <1 ms (Magnetoresistive - Hall effect)	<1 ms
Operating temperature	-10°C ÷ 80°C	-10°C ÷ 60°C
Electrical duration	10000000 cycles (Reed) 1000000000 cycles (Magnetoresistive - Hall effect)	
Electrical connections	with a 2-wire cable, section 2x0.14, 2m (standard), high flexibility; with a 3-wire cable, section 3x0.14, 2m (standard), high flexibility; with a M8 connector and cable of 0.3 m	with a 2-wire cable, section 2x0.14, 2m (standard), high flexibility (CSB, CSC only); with a 3-wire cable, section 3x0.14, 2m (standard), high flexibility (CSD only); with a M8 connector and cable of 0.3 m (CSD only)

SERIES CST, CSV, CSH CODING EXAMPLE

CS	T	-	2	2	0	N	-	5

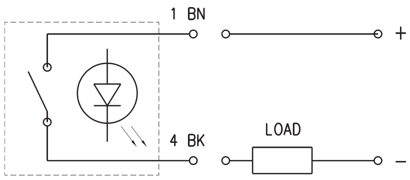
CS	SERIES
T	TYPE OF SLOT: T = T-slot V = V-slot H = H-slot
2	OPERATION: 2 = Reed NO 3 = Magnetoresistive 4 = Reed NC 5 = Hall effect
2	CONNECTIONS: 2 = 2 wires (Reed only) 3 = 3 wires 5 = 2 wires with M8 connector (Reed only) 6 = 3 wires with M8 connector
0	POWER SUPPLY VOLTAGE: 0 = 10 ÷ 110V DC; 10 ÷ 230V AC (PNP) 1 = 30 ÷ 110V DC; 30 ÷ 230V AC (PNP) 2 = 3 wires cst (PNP) 3 = 10 ÷ 30V AC/DC (PNP) 4 = 10 ÷ 27V DC (PNP)
N	NOTE (CST/CSV-250N only): N = according to norm
5	LENGTH OF THE CABLE: = 2m (CST and CSV only) 2 = 2m (CSH only) 5 = 5m

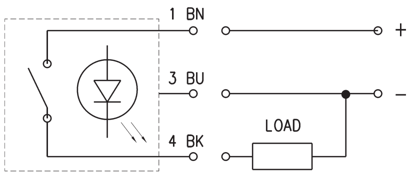
SERIES CSB, CSC, CSD CODING EXAMPLE

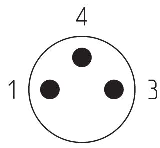
CS	B	-	D	-	2	2	0	-	

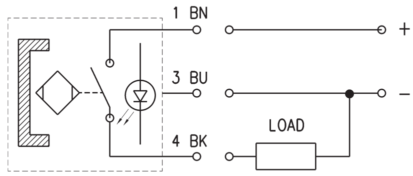
CS	SERIES
B	TYPE OF SLOT: B = B-slot C = C-slot D = D-slot
D	CABLE OUTPUT: D = straight H = 90°
2	OPERATION: 2 = Reed NC (CSB, CSC only) 3 = Magnetoresistive (CSD only)
2	CONNECTIONS: 2 = 2 wires (CSB, CSC only) 3 = 3 wires (CSD only) 6 = 3 wires with M8 connector (CSD only)
0	POWER SUPPLY VOLTAGE: 0 = 10 ÷ 110V DC/AC (CSB, CSC only) 4 = 10 ÷ 27V DC PNP (CSD only)
	LENGTH OF THE CABLE: = 2m (standard) 5 = 5m

SWITCHES ELECTRICAL CONNECTIONS









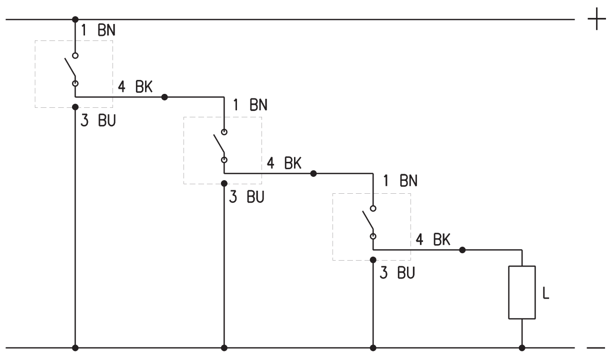
Reed switches
BN = brown
BU = blue
BK = black

Magnetoresistive and Hall effect switches
BN = brown
BU = blue
BK = black

Connecting schemes in series

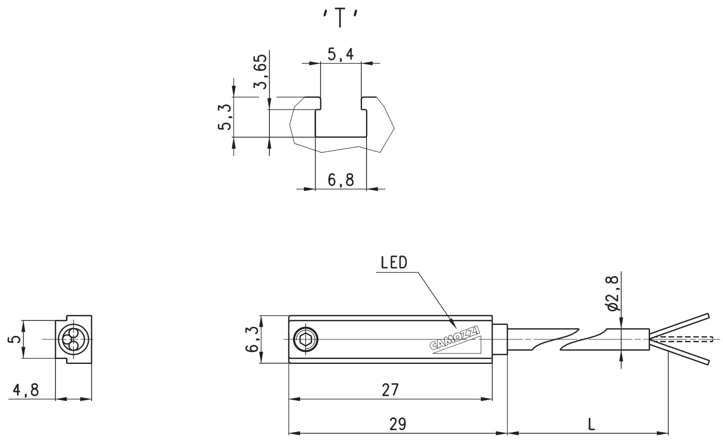
The 3-wire version of the Reed sensors has been designed to allow the connection of several sensors in series, as there is no voltage drop between the supply and the load.
See connecting scheme.
The voltage drop is 2.8V for the 2-wire Reed sensors and 1.0V for 3-wire Magnetoresistive and Hall effect sensors.

1 BN = Brown
3 BU = Blue
4 BK = Black
L = load



Magnetic proximity switches with 2- or 3-wire cable for T-slot

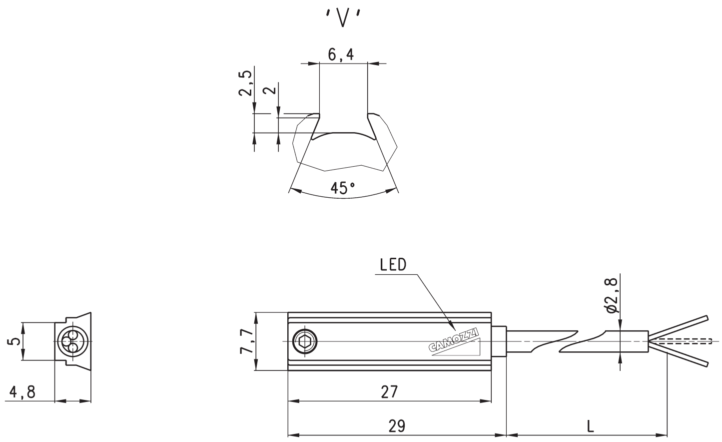
Note for Mod. CST-220, CST-220-5:
in case of polarity reversing the sensor will still be operating, but the LED diode won't turn on.



Mod.	Operation	Connections	Voltage	Output	Max. current	Max Load	Protection	L = length cable
CST-220	Reed	2 wires	10 ÷ 110 V AC/DC-230 V AC	-	250 mA	10 VA / 8W	None	2 m
CST-220-5	Reed	2 wires	10 ÷ 110 V AC/DC-230 V AC	-	250 mA	10 VA / 8 W	None	5 m
CST-232	Reed	3 wires	5 ÷ 30 V AC/DC	PNP	250 mA	10 VA / 8 W	Against polarity reversing	2 m
CST-232-5	Reed	3 wires	5 ÷ 30 V AC/DC	PNP	250 mA	10 VA / 8 W	Against polarity reversing	5 m
CST-332	Magnetoresistive	3 wires	10 ÷ 27 V DC	PNP	100 mA	6 W	Against polarity reversing and overvoltage	2 m
CST-332-5	Magnetoresistive	3 wires	10 ÷ 27 V DC	PNP	100 mA	6 W	Against polarity reversing and overvoltage	5 m
CST-532	Hall effect	3 wires	10 ÷ 27 V DC	PNP	100 mA	6 W	Against polarity reversing and overvoltage	2 m
CST-532-5	Hall effect	3 wires	10 ÷ 27 V DC	PNP	100 mA	6 W	Against polarity reversing and overvoltage	5 m

Magnetic proximity switches with 2- or 3-wire cable for V-slot

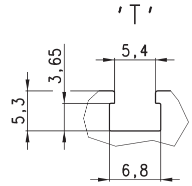
Note for Mod. CSV-220:
In case of polarity reversing the sensor will still be operating, but the LED diode won't turn on.



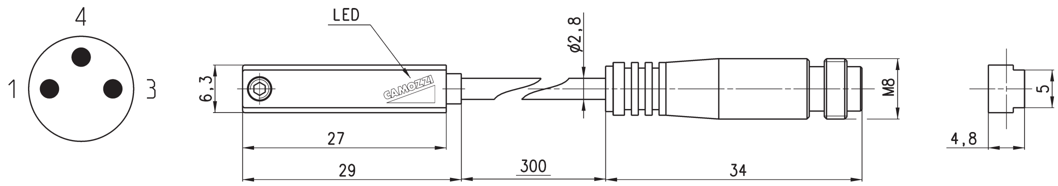
Mod.	Operation	Connections	Voltage	Output	Max. current	Max Load	Protection	L = length cable
CSV-220	Reed	2 wires	10 ÷ 110 V AC/DC-230 V AC	-	250 mA	10 VA / 8 W	None	2 m
CSV-232	Reed	3 wires	5 ÷ 30 V AC/DC	PNP	250 mA	10 VA / 8W	Against polarity reversing	2 m
CSV-332	Magnetoresistive	3 wires	10 ÷ 27 V DC	PNP	100 mA	6 W	Against polarity reversing and overvoltage	2 m

Magnetic proximity switches with M8 3-pin connector for T slot

Note for Mod. CST-250N:
in case of polarity reversing the sensor will still be operating, but the LED diode won't turn on.



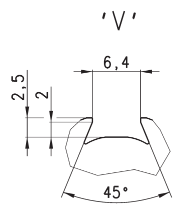
Cable length: 0.3 m



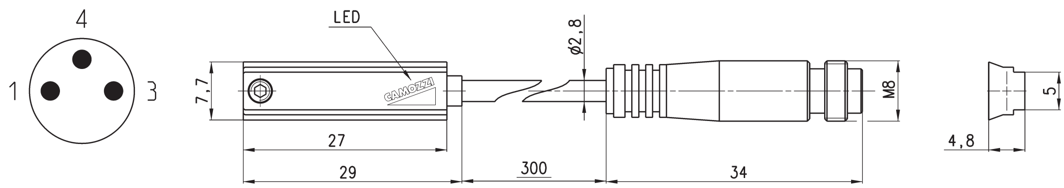
Mod.	Operation	Connection	Voltage	Output	Max. current	Max load	Protection
CST-250N	Reed	2 wires M8 male 3 pin	10 ÷ 110 V AC/DC	-	250 mA	10 VA / 8 W	None
CST-262	Reed	3 wires M8 male 3 pin	5 ÷ 30 V AC/DC	PNP	250 mA	10 VA / 8 W	Against polarity reversing
CST-362	Magnetoresistive	3 wires M8 male 3 pin	10 ÷ 27 V DC	PNP	100 mA	6 W	Against polarity reversing and overvoltage
CST-562	Hall effect	3 wires M8 male 3 pin	10 ÷ 27 V DC	PNP	100 mA	6 W	Against polarity reversing and overvoltage

Magnetic proximity switches with M8 3-pin connector for V slot

Note for Mod. CSV-250N:
in case of polarity reversing the sensor will still be operating, but the LED diode won't turn on.



Cable length: 0.3 m

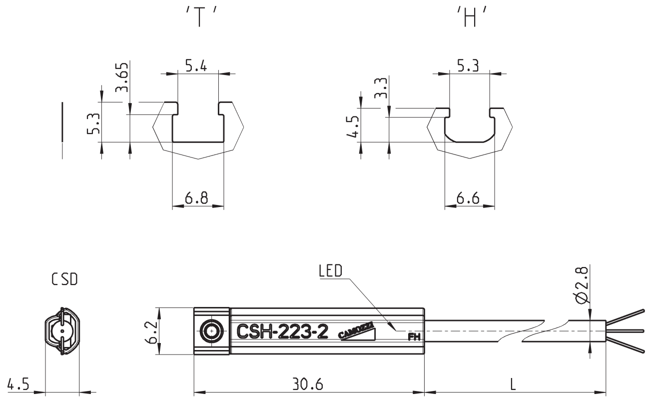


Mod.	Operation	Connection	Voltage	Output	Max. current	Max load	Protection
CSV-250N	Reed	2 wires M8 male 3 pin	10 ÷ 110 V AC/DC	-	250 mA	10 VA / 8 W	None
CSV-262	Reed	3 wires M8 male 3 pin	5 ÷ 30 V AC/DC	PNP	250 mA	10 VA / 8 W	Against polarity reversing
CSV-362	Magnetoresistive	3 wires M8 male 3 pin	10 ÷ 27 V DC	PNP	100 mA	6 W	Against polarity reversing and overvoltage

Magnetic proximity switches with 2- or 3-wire cable for H-slot

Note for Mod. CSH-223-2, CSH-223-5, CSH-221-2, CSH-221-5:
in case of polarity reversing the sensor will still be operating, but the LED diode won't turn on.

Suitable also for T-slots

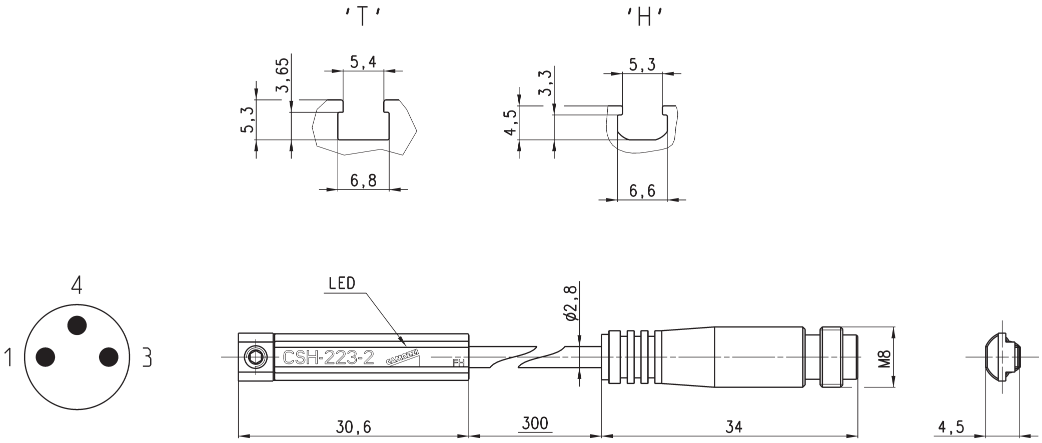


Mod.	Operation	Connection	Voltage	Output	Max current	Max load	Protection	L = cable legth
CSH-223-2	Reed	2 wires	10 ÷ 30 V AC/DC	-	250 mA	10 VA / 8 W	Against polarity reversing	2 m
CSH-223-5	Reed	2 wires	10 ÷ 30 V AC/DC	-	250 mA	10 VA / 8 W	Against polarity reversing	5 m
CSH-221-2	Reed	2 wires	30 ÷ 230 V AC - 30 ÷ 110 V DC	-	250 mA	10 VA / 8 W	Against polarity reversing	2 m
CSH-221-5	Reed	2 wires	30 ÷ 230 V AC - 30 ÷ 110 V DC	-	250 mA	10 VA / 8 W	Against polarity reversing	5 m
CSH-233-2	Reed	3 wires	10 ÷ 30 V AC/DC	PNP	250 mA	10 VA / 8 W	Against polarity reversing	2 m
CSH-233-5	Reed	3 wires	10 ÷ 30 V AC/DC	PNP	250 mA	10 VA / 8 W	Against polarity reversing	5 m
CSH-334-2	Magnetoresistive	3 wires	10 ÷ 27 V DC	PNP	250 mA	6 W	Against polarity reversing and overvoltage	2 m
CSH-334-5	Magnetoresistive	3 wires	10 ÷ 27 V DC	PNP	250 mA	6 W	Against polarity reversing and overvoltage	5 m

Magnetic proximity switches wtih M8 3-pin connector for H-slot

Note for Mod. CSH-253:
in case of polarity reversing the sensor will still be operating, but LED diode won't turn on.

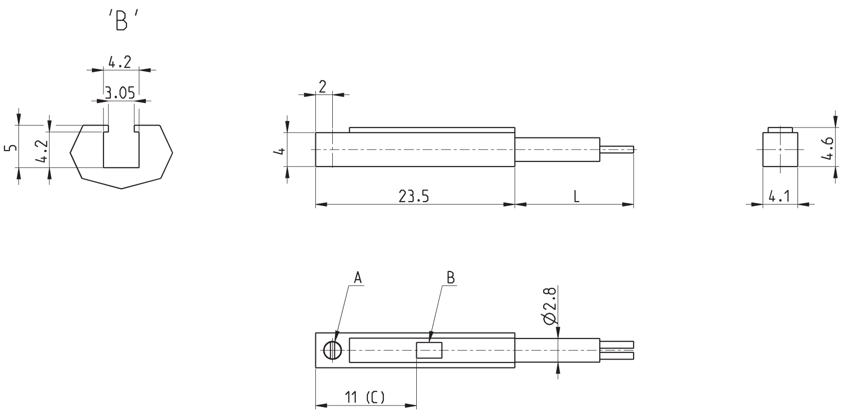
Suitable also for T-slots
Cable length: 0.3 m



Mod.	Operation	Connection	Voltage	Output	Max current	Max load	Protection
CSH-253	Reed NO	2 wires M8 male 3 pin	10 ÷ 30 V AC/DC	-	250 mA	10 VA / 8 W	Against polarity reversing
CSH-263	Reed NO	3 wires M8 male 3 pin	10 ÷ 30 V AC/DC	PNP	250 mA	10 VA / 8 W	Against polarity reversing
CSH-364	Magnetoresistive	3 wires M8 male 3 pin	10 ÷ 27 V DC	PNP	250 mA	6 W	Against polarity reversing and overvoltage
CSH-463	Reed NC	3 wires M8 male 3 pin	10 ÷ 30 V AC/DC	PNP	250 mA	10 VA / 8 W	Against polarity reversing

Magnetic proximity switch with 2-wire cable for B-slot

A = fixing screw - B = Led indicator - C = ideal position detection

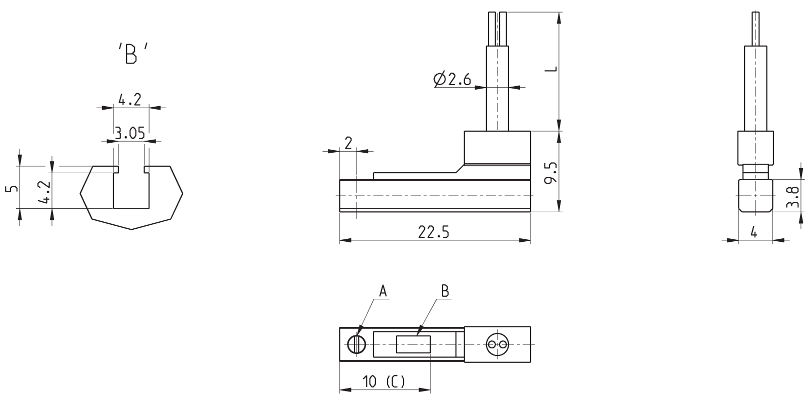


In case of polarity reversing the sensor will still be operating, but the LED diode won't turn on.

Mod.	Operation	Connection	Voltage	Output	Max. current	Max load	Protection
CSB-D-220	Reed	2 wires	10÷110 V AC/DC	PNP	50 mA	8 W / 10 VA	Against polarity reversing and overvoltage

Magnetic proximity switch with 2-wire 90° cable for B-slot

A = fixing screw - B = Led indicator - C = ideal position detection



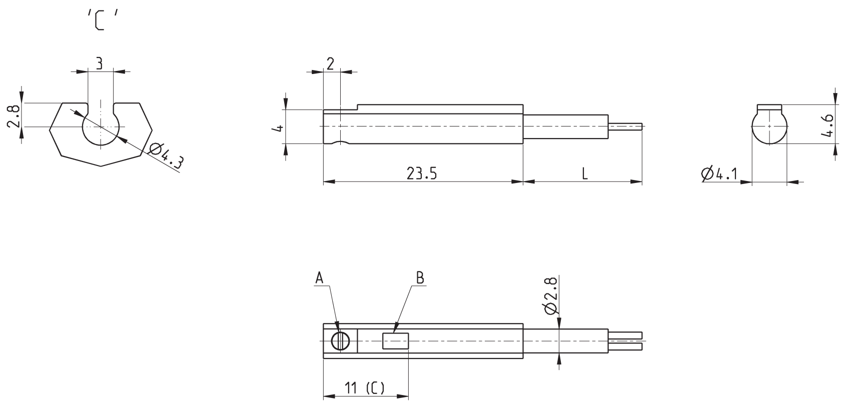
In case of polarity reversing the sensor will still be operating, but the LED diode won't turn on.

Mod.	Operation	Connection	Voltage	Output	Max. current	Max load	Protection
CSB-H-220	Reed	2 wires	10÷110 V AC/DC	PNP	50 mA	8 W / 10 VA	Against polarity reversing and overvoltage

Magnetic proximity switch with 2-wire cable for C-slot

A = fixing screw - B = Led indicator - C = ideal position detection

In case of polarity reversing the sensor will still be operating, but the LED diode won't turn on.

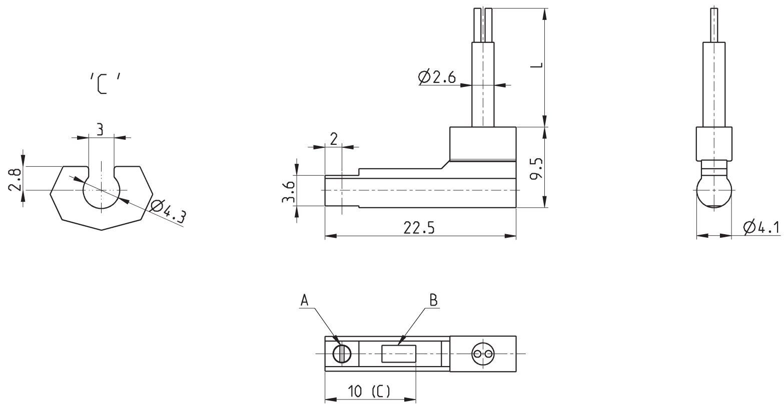


Mod.	Operation	Connection	Voltage	Output	Max. current	Max load	Protection
CSC-D-220	Reed	2 wires	10÷110 V AC/DC	PNP	50 mA	8 W / 10 VA	Against polarity reversing and overvoltage

Magnetic proximity switch with 2-wire 90° cable for C-slot

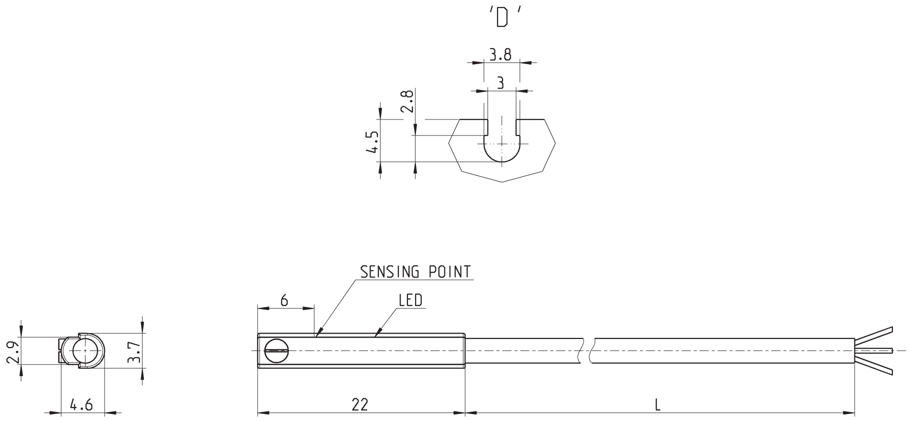
A = fixing screw - B = Led indicator - C = ideal position detection

In case of polarity reversing the sensor will still be operating, but the LED diode won't turn on.



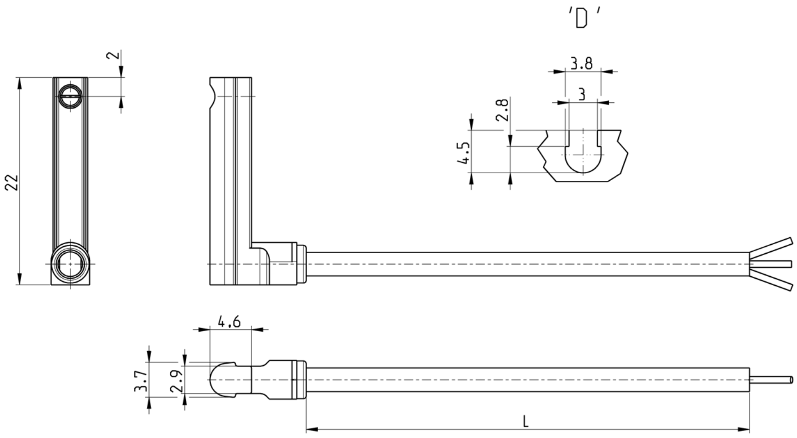
Mod.	Operation	Connection	Voltage	Output	Max. current	Max load	Protection
CSC-H-220	Reed	2 wires	10÷110 V AC/DC	PNP	50 mA	8 W / 10 VA	Against polarity reversing and overvoltage

Magnetic proximity switches, 3-wire cable, D-slot



Mod.	Operation	Connections	Voltage	Output	Max. current	Max Load	Protection	L = length cable
CSD-D-334	Magnetoresistive	3 wires	10 ÷ 27 V DC	PNP	200 mA	6W	Against polarity reversing and overvoltage	2 m
CSD-D-334-5	Magnetoresistive	3 wires	10 ÷ 27 V DC	PNP	200 mA	6W	Against polarity reversing and overvoltage	5 m

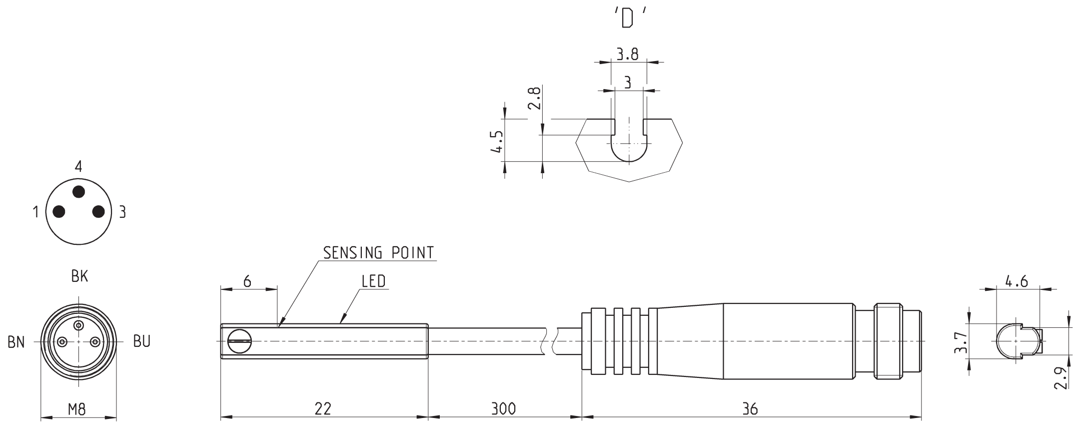
Magnetic proximity switches, 3-wire cable, D-slot with 90° cable



Mod.	Operation	Connections	Voltage	Output	Max. current	Max Load	Protection	L = length cable
CSD-H-334	Magnetoresistive	3 wires	10 ÷ 27 V DC	PNP	200 mA	6 W	Against polarity reversing and overvoltage	2 m
CSD-H-334-5	Magnetoresistive	3 wires	10 ÷ 27 V DC	PNP	200 mA	6 W	Against polarity reversing and overvoltage	5 m

Magnetic proximity switches, male M8 3-pin conn., D-slot, right

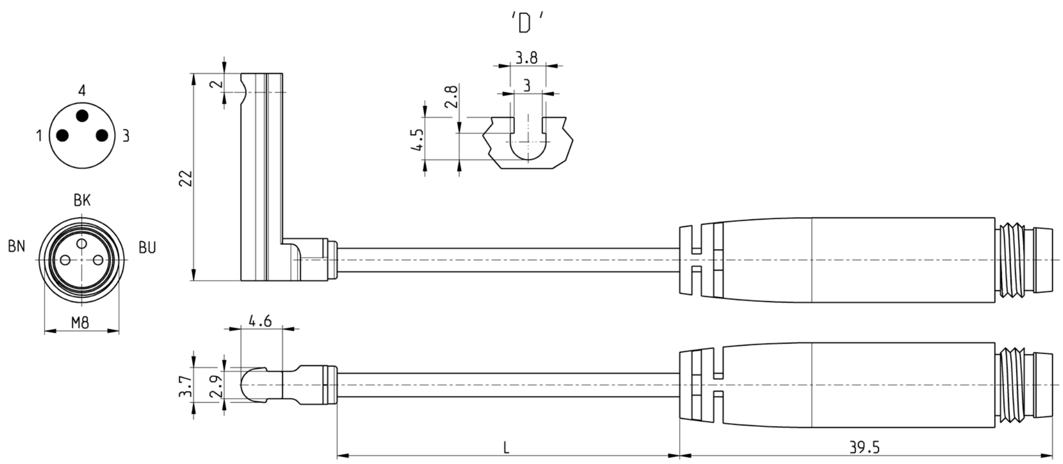
Cable length: 0.3 m



Mod.	Operation	Connection	Voltage	Output	Max current	Max load	Protection
CSD-D-364	Magnetoresistive	3 wires with M8 connector	10 ÷ 27 V DC	PNP	200 mA	6 W	Against polarity reversing and overvoltage

Magnetic proximity switches, male M8 3-pin conn., D-slot, 90°

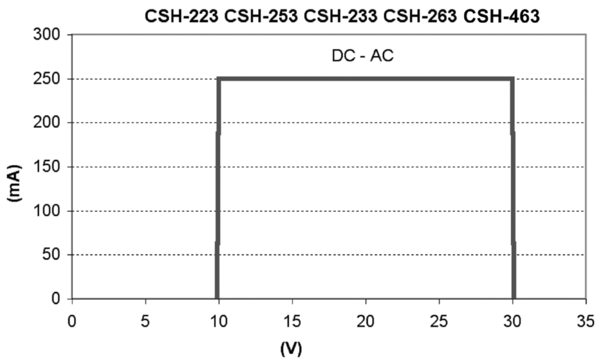
Cable length: 0.3 m



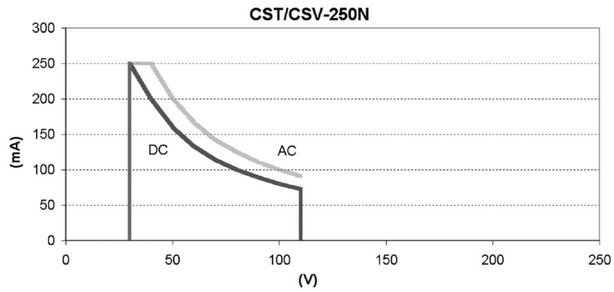
Mod.	Operation	Connection	Voltage	Output	Max current	Max load	Protection
CSD-H-364	Magnetoresistive	3 wires with M8 connector	10 ÷ 27 V DC	PNP	200 mA	6 W	Against polarity reversing and overvoltage

Load curves CSH, CST/CSV

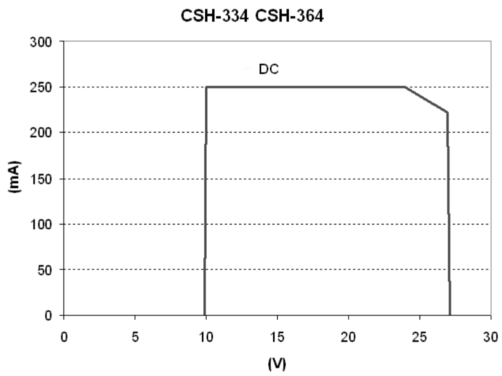
Load curve - CSH



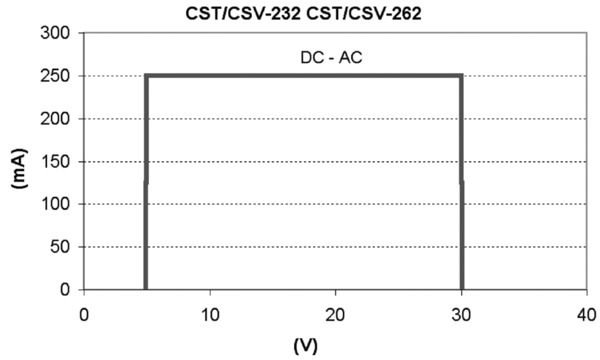
Load curve - CST/CSV



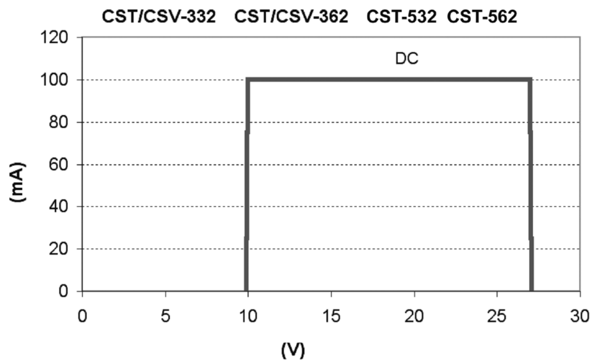
Load curve - CSH



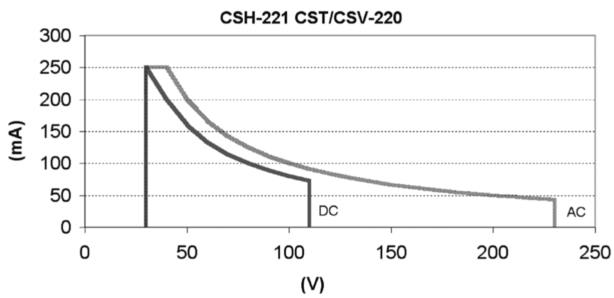
Load curve - CST/CSV



Load curve - CST/CSV

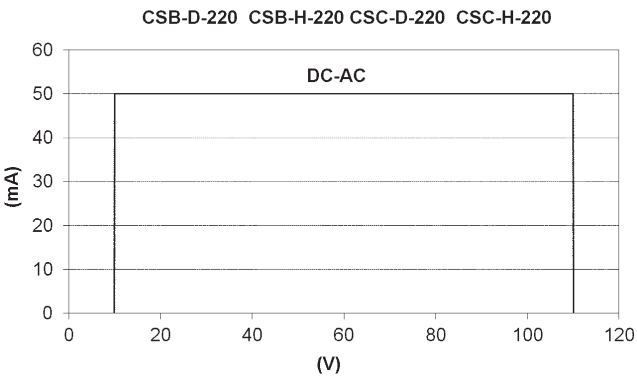


Load curve - CSH, CST/CSV

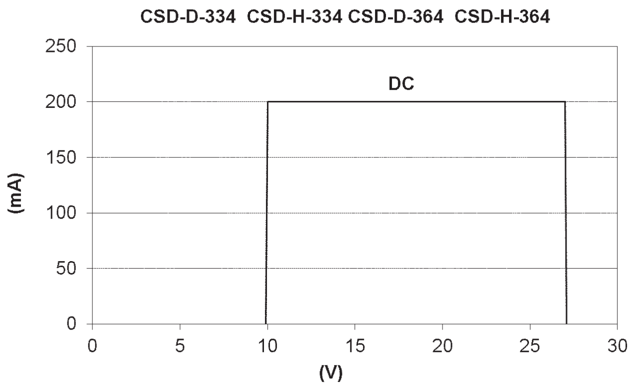


Load curves CSB/CSC, CSD

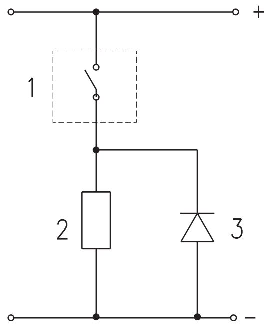
Load curve - CSB/CSC



Load curve - CSD

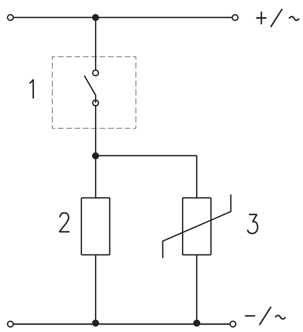


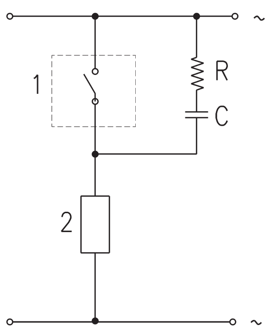
Electric circuit with protection against voltage spikes



DC applications: there is no protection on the Reed sensors on the inductive load, therefore it is advisable to use an electric ciruit with protection against the voltage spikes.
See picture above for a typical example.
Legend:
1 = Sensor
2 = Load
3 = Protection diode

Electric circuit with protection against voltage spikes



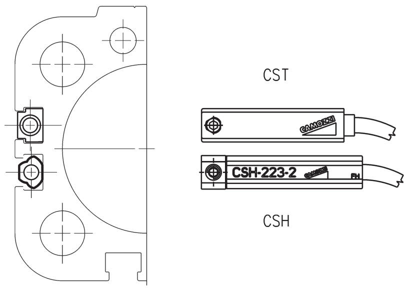


DC and AC applications: there is no protection on the Reed sensors on the inductive load, therefore it is advisable to use an electric ciruit with protection against the voltage spikes.
See picture above for a typical example.
Legend:
1 = Sensor
2 = Load
3 = Protection varistor

AC applications: there is no protection on the Reed sensors on the inductive load, therefore it is advisable to use an electric circuit with protection against the voltage spikes.
See picture above for a typical example.
Legend:
1 = Sensor
2 = Load
C + R = Series of resistor and protection capacitor

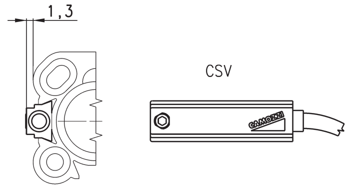
Mounting of Series CST - CSH sensors

CST/CSH sensors can be directly mounted on the following cylinders:
Series 31 - 31R
Series 32 - 32R
Series 52
Series 61
Series 62 (CSH only)
Series 69
Series QC - QCBF - QCTF



Mounting of Series CSV sensors

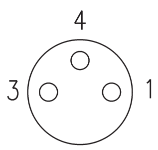
CSV sensors must be assembled directly into the groove of cylinders:
Series 50 ø 16÷25
Series QP - QPR ø 12÷16

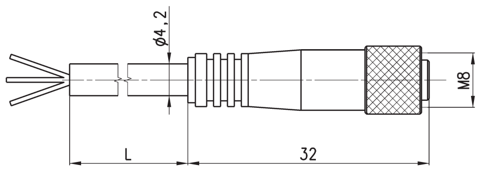


3-wire extension with M8 3-pin female connector

With PU sheathing, non shielded cable.
Protection class: IP65

1 BN = Brown
3 BK = Black
4 BU = Blue



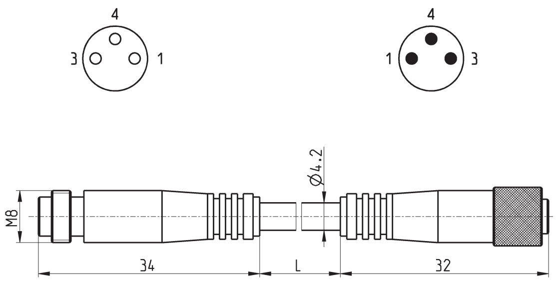


In case 2-wire sensors with M8 connector (Mod. CST-250N, CSV-250N, CSH-253) are used, please connect the brown wire to the supply (+) and the black wire to the load.

Mod.	L = cable length (m)
CS-2	2
CS-5	5
CS-10	10

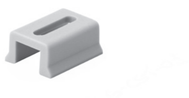
3-wire extension with M8 3-pin male / female connector

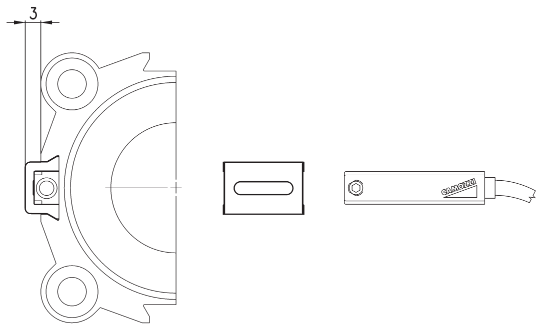
Non shielded



Mod.	cable length “L” (m)
CS-DW03HB-C250	2,5
CS-DW03HB-C500	5

Adapters Mod. S-CST-01 for Series CST-CSH sensors

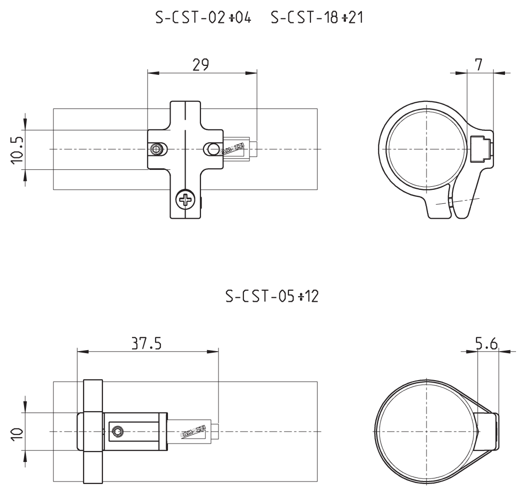




Mod.	Series QP-QPR cylinders	Series 50 cylinders
S-CST-01	Ø 20 ÷ 100	Ø 32 ÷ 80

Adapters Mod. S-CST-02..21 for Series CST-CSH sensors

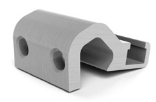
Materials:
- stainless steel and technopolymer (S-CST-05÷12)
- technopolymer (S-CST-02÷04)
- technopolymer (S-CST-18÷21)

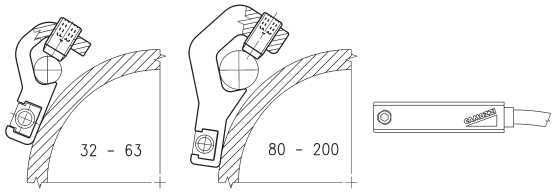


Mod.	Cylinders Series	Ø
S-CST-02	24-25-27	16
S-CST-03	24-25-27	20
S-CST-04	24-25-27	25
S-CST-05	94, 95	16-20-25 (94), 16-20 (95)
S-CST-06	90-92-97, 95	32 (90-92-97), 25 (95)
S-CST-07	90-92-97	40
S-CST-08	90-92-97	50
S-CST-09	90-92-97	63
S-CST-10	90	80
S-CST-11	90	100
S-CST-12	90	125
S-CST-18	27-42	32
S-CST-19	27-42	40
S-CST-20	27-42	50
S-CST-21	27-42	63

Adapters Mod. S-CST-25..28 for Series CST-CSH sensors

Material: anodized aluminium

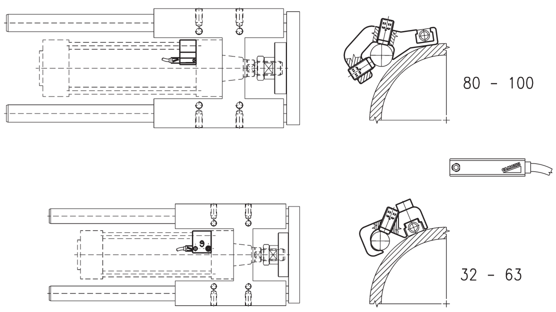




Mod.	Cylinders series	Ø
S-CST-25	60 - 90 - 63MT	32 ÷ 63
S-CST-26	60 - 90 - 63MT	80 ÷ 100
S-CST-27	60 - 90 - 63MT	125
S-CST-28	40	160 - 200

Adapters for Series CST and CSH sensors

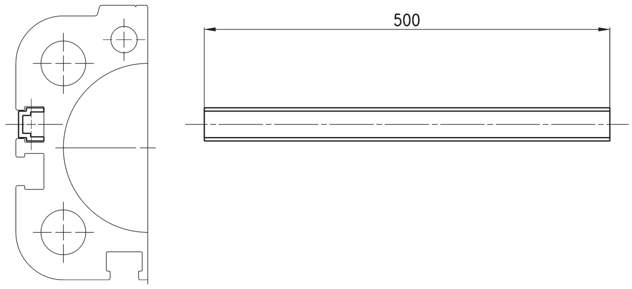
For Series 60 cylinders mounted with guides 45NHT or 45NHB



Mod.	Cylinders series	Ø
S-CST-45N1	60 - 90 - 63MT	32 ÷ 63
S-CST-45N2	60 - 90 - 63MT	80 ÷ 100

Slot cover profile suitable for actuators with T- and H-slot

Supplied with 500 mm tube



Mod.	Series of cylinders
S-CST-500	31, 31 Tandem and Multi-position, QCT, QCB, QCBT, QCBF, 61, 62, 63MP, 6E, 5E, 69, 32, 32 Tandem and Multi-position

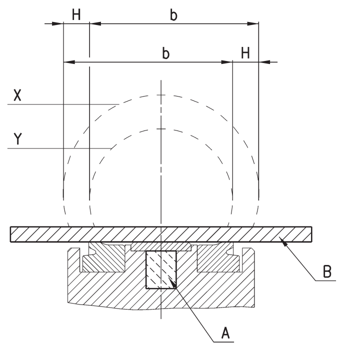
CONTACT STROKE AND HYSTERESIS - correct use of magnetic sensors

The magnetic sensors consist of a reed switch which is contained in a glass bulb filled with a rarefied gas. The switches (or contacts) that are made of magnetic material (nickel-iron) are flexible and are coated, at the contact points, with high quality non-arcing materials. Switching is effected by means of a suitable magnetic field and actuation is achieved by means of the permanent magnet inside the piston.

NOTE: THE PRESENCE OF IRON MASSES NEAR THE CYLINDER OR THE GRIPPERS (LIKE IRON SCREWS AND FIXING PLATES) CAN CHANGE THE DIRECTION AND THE POWER OF THE MAGNETIC FIELD.

The Reed sensors are Normally Open, therefore, when subjected to the effect of the magnetic field, close the circuit.

OPERATING FIELD OF SENSORS
WITH RESPECT TO THE MAGNETIC PISTON (below picture)
The maximum speed (in m/second) for a cylinder guided by magnetic sensors is given by b/t = speed where:
b = contact stroke in mm (see the table) - this value indicates the amplitude of the magnetic field or switching field when the circuit is closed.
t = total reaction time in milliseconds of the electric control components connected downstream of the sensor
H = operational hysteresis of the sensor with respect to the shape and amplitude of the magnetic field.
A = magnet
B = actuator
X =
Y =
The operating field, as a result of hysteresis, is displaced by the value H in the opposite direction to movement of the cylinder. The maximum speed permitted for each cylinder depends on value b and on reaction time of the different components connected downstream of the sensor.



Series	Ø	b (mm)	H (mm)
24-25	16	9.2	1.2
24-25	20	12	1
24-25	25	11.7	1.1
27	20	10.5	1.6
27	25	10.9	1.6
27	32	10.7	1.1
27	40	12.1	1.7
27	50	12.1	1.2
27	63	14.1	1.3
QP	12	10	1.3
QP	16	11.8	1.5
QP	20	11.1	1.6
QP	25	10.6	1.6
QP	32	12.7	1.2
QP	40	12.5	1.1
QP	50	15.4	1.6
QP	63	16.7	1.5
QP	80	13.2	1.7
QP	100	16.8	1.8
31-32-ST	12	9.2	1.4
31-32-ST	16	7.9	1.3
31-32-ST	20	9.1	1.5
31-32-ST	25	10.6	1.5
31-32-ST	32	11.9	1.7
31-32-ST	40	12.9	2.2
31-32-ST	50	14.7	1.2
31-32-ST	63	15.2	1.4
31-32-ST	80	16.6	1.8
31-32-ST	100	16,8	1,7
40	160	24	2
40	200	26	2

Series	Ø	b (mm)	H (mm)
60	32	9.9	1
60	40	8.9	1.2
60	50	10.7	1
60	63	12.9	1.2
60	80	11.5	1.4
60	100	14.9	1.4
60	125	22	1
61	32	9	1
61	40	9.3	1.3
61	50	11	1.6
61	63	13.4	1.3
61	80	13.2	1.6
61	100	15.2	1.7
61	125	22.1	1.3
42	32	10.8	1.5
42	40	11.2	1.6
42	50	12.6	1.7
42	63	14.1	1.7
QCT	20	10	1.7
QCT	25	11.4	1.8
QCT	32	12.1	1.8
QCT	40	12.4	1.8
QCT	50	13.7	1.9
QCT	63	13.5	1.8
69	32	34.5	3.8
69	40	29.6	4.1
69	50	31.5	4.6
69	63	32.3	3.1
69	80	24	2.9
69	100	25.6	2.9
69	125	30.1	1.7

Series	Ø	b (mm)	H (mm)
62-63-6PF	32	10	1
62-63-6PF	40	11	1
62-63-6PF	50	12	1.2
62-63-6PF	63	13	1
62-63-6PF	80	13	1
62-63-6PF	100	16	1
52	25	19.3	1.8
52	32	27.9	1.6
52	40	26	2.3
52	50	39.9	2.9
52	63	40.7	4.2