

# Series CST - CSV and CSH magnetic proximity switches

1

MOVEMENT

Reed, Electronic



- » Designed to fit into the grooves provided in the profile barrel of the cylinder
- » The three Series CST - CSV - CSH are suitable for the whole Camozzi range of cylinders
- » With or without M8 connector

These switches are available in two different versions: Reed with mechanical switching and electronic with electronic switching. The electronic versions are suggested for heavy duty with frequent operations and strong vibrations.

Series CST-CSV-CSH 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 LED diode shows when the internal magnetic contact is closed.

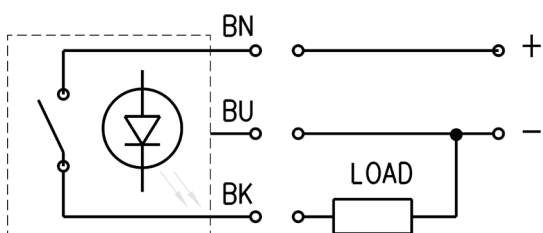
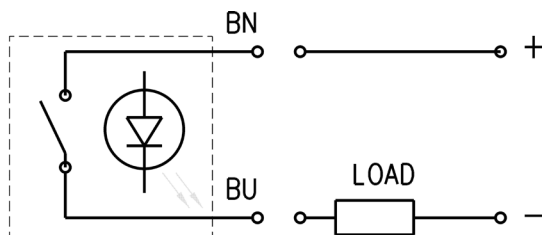
## GENERAL DATA

<b>Models</b>	CST-... CSV-... CSH-...
<b>Operation</b>	Reed contact Electronic
<b>Type of output</b>	Static or electronic PNP
<b>Type of contact</b>	Normally Open (NO) or Normally Closed (NC) contacts
<b>Voltage</b>	See model characteristics
<b>Max current</b>	See model characteristics
<b>Max load</b>	Reed switches 8 W DC and 10 VA AC Electronic switches 6 W DC
<b>Protection</b>	IP 67
<b>Materials</b>	Plastic body encapsulating epoxy resin cable in PVC connector PVR connector body in PU
<b>Mounting</b>	Directly into the grooves, or by means of adapters.
<b>Signalling</b>	By means of yellow diode Led
<b>Protections</b>	See model characteristics
<b>Switching time</b>	Reed switches <1,8 ms Electronic switches <1 ms
<b>Operating temperature</b>	-10 °C + 80 °C
<b>Electrical duration</b>	Reed switches 10.000.000 cycles Electronic switches 1.000.000.000 cycles
<b>Electrical connection</b>	cable 2x0,14 (2m) high flexibility cable 3x0,14 (2m) high flexibility connector M8 and cable 0,3 m

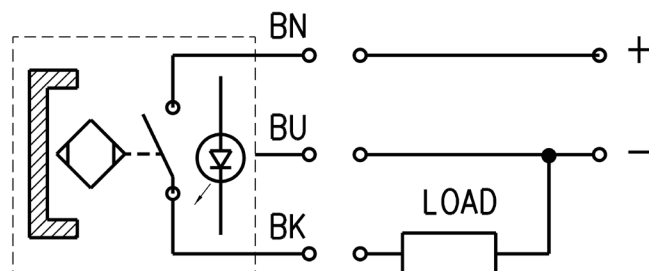
**CODING EXAMPLE**

<b>CS</b>	<b>T</b>	<b>-</b>	<b>2</b>	<b>2</b>	<b>0</b>	<b>N</b>	<b>-</b>	<b>5</b>
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<b>CS</b>	SERIES
<b>T</b>	SLOT TYPE T = T-slot V = V-slot H = frontal inserting slot
<b>2</b>	OPERATION 2 = reed NO 3 = electronic 4 = reed NC
<b>2</b>	CONNECTIONS 2 = 2 wires (Reed only ) 3 = 3 wires 5 = 2 wires with M8 connector (Reed only ) 6 = 3 wires with M8 connector
<b>0</b>	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)
<b>N</b>	NOTE N = ACCORDING TO NORM (CST/CSV-250N only)
<b>5</b>	LENGTH OF THE CABLE (for CSH only): 2 = 2 m 5 = 5 m

**SWITCHES ELECTRICAL CONNECTIONS**


**Reed switches**  
 BN = brown  
 BU = blue  
 BK = black

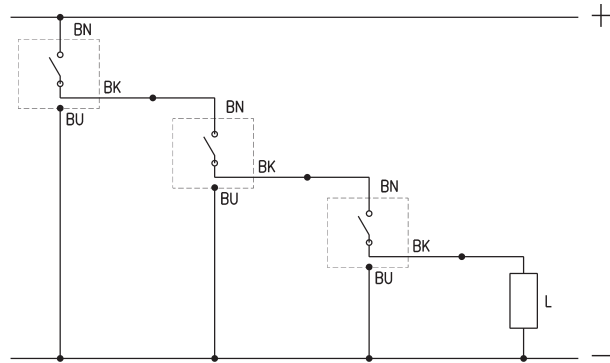


**Electronic switches**  
 BN = brown  
 BU = blue  
 BK = black

### Connecting schemes in series

The Reed version with 3 wires allows 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 Reed sensors with 2 wires and 1V for Hall effect sensors with 3 wires.

- BN = brown
- BU = blue
- BK = black
- L = load



### Useful information for correct use of the magnetic sensors

The magnetic sensors consist of a reed switch which is enclosed in a glass bulb containing a rarified gas. The contacts, which are made of magnetic material (nickel-iron), are flexible and are coated, at the contact points with a high quality non-arcing material.

Switching is effected by means of a suitable magnetic field and actuation is achieved by means of the permanent magnet inside the piston. The two sensors are of the normally open type and, therefore, when they are subject to the effect of the magnetic field, they close the circuit.

The operating field of the sensors with respect to the magnetic piston is shown in this picture. The dimension *b* indicates the amplitude of the magnetic field or switching field during which the circuit is closed. The value *H* represents the operational hysteresis of the sensor with respect to the form and amplitude of the magnetic field. The operating field, as a result of hysteresis, is displaced by the dimension *H* in the opposite direction to movement of the piston.

The values *b* and *H* are shown in the table and are classified according to bore.

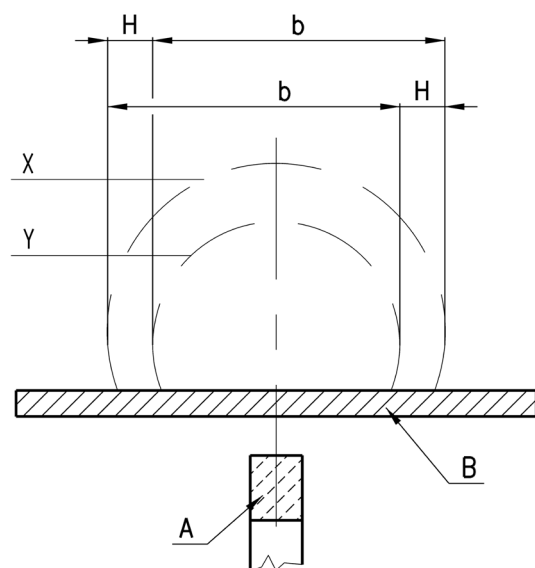
The maximum speed permitted for each cylinder is a function of the value *b* and the response time of the various components connected after the sensor.

The maximum speed for a cylinder guided by magnetic sensors is calculated as follows:  $b / t = \text{Speed}$

where: *b* = contact stroke in mm (see table)

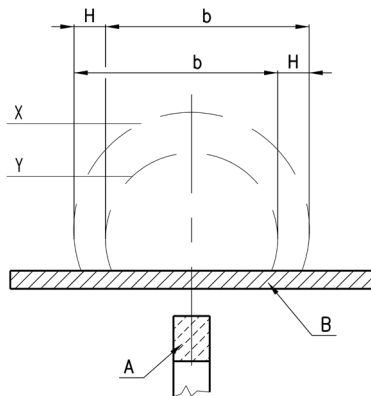
*t* = total reaction time in milli seconds of electric control components connected after the sensor

Speed = maximum speed in m/second



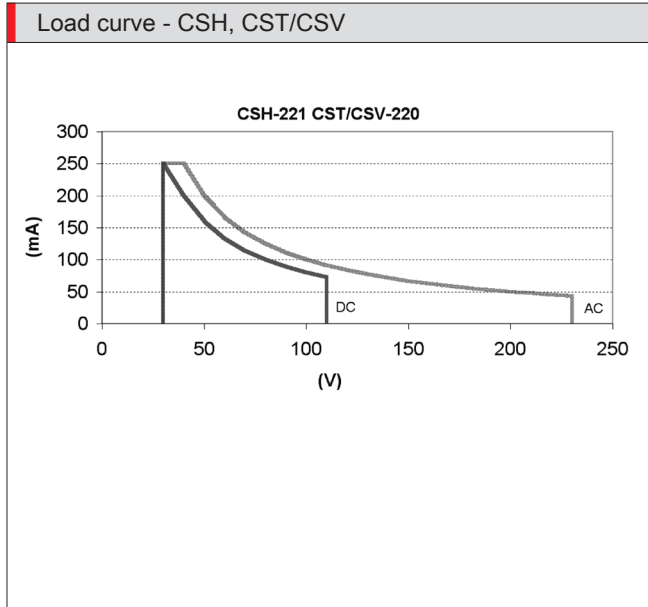
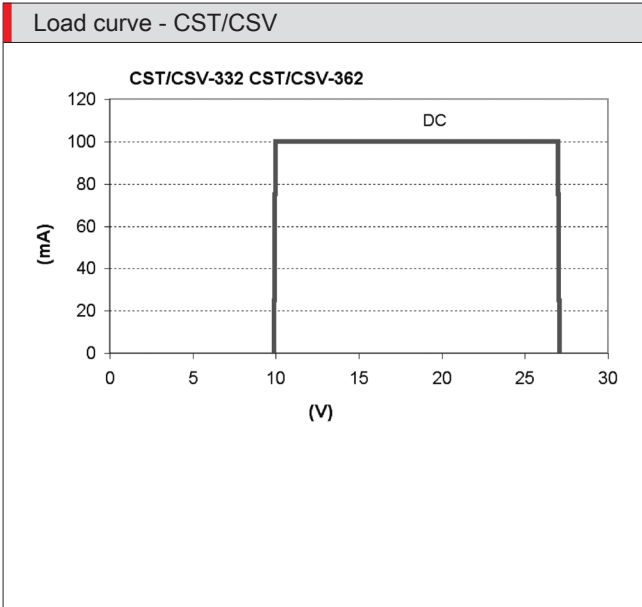
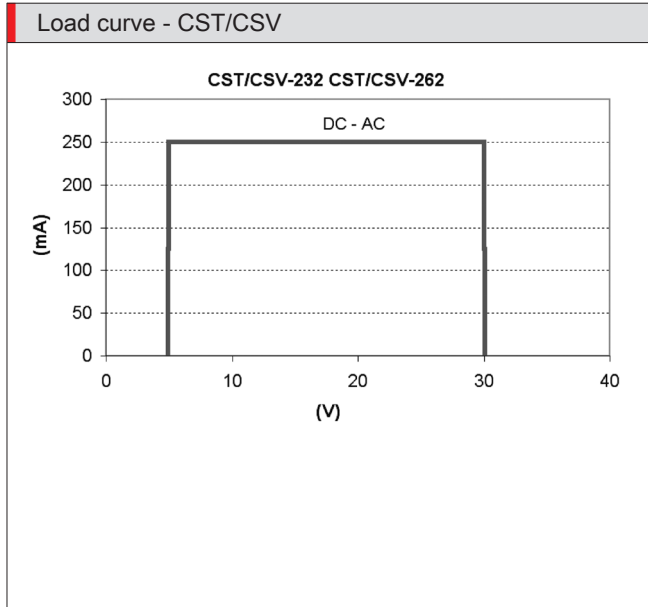
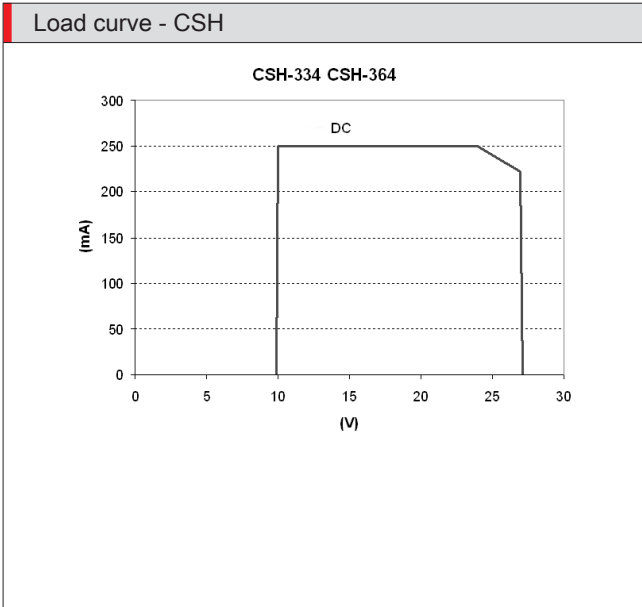
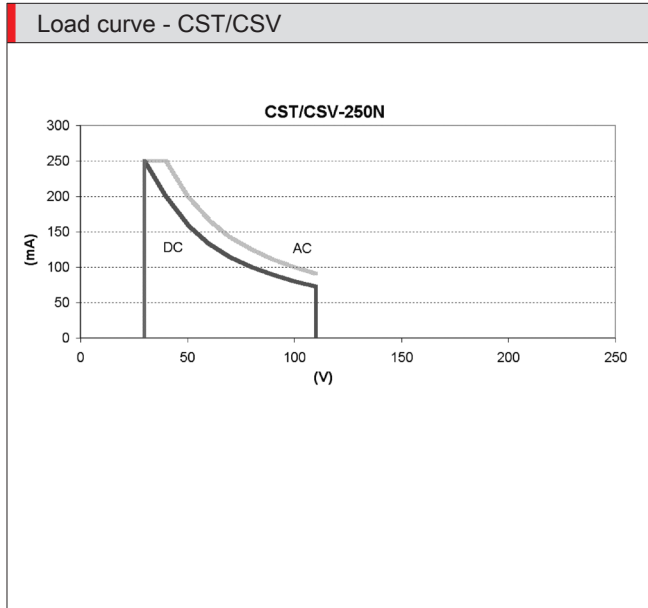
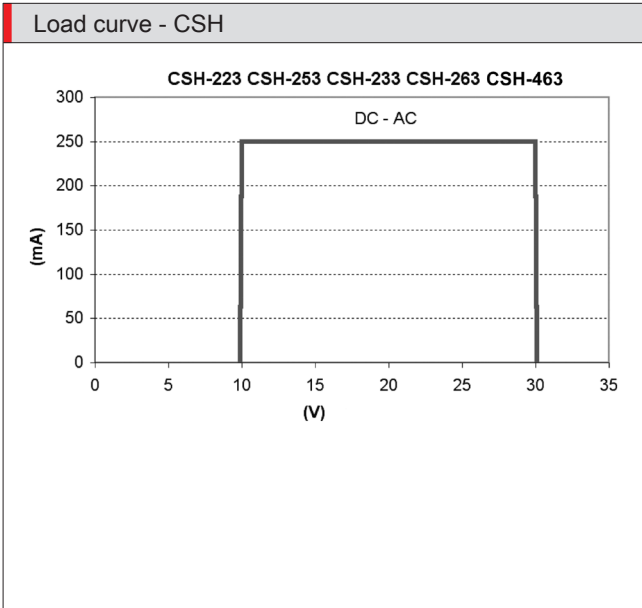
**CONTACT STROKE AND HYSTERESIS**

Useful information for correct use of the magnetic sensors:

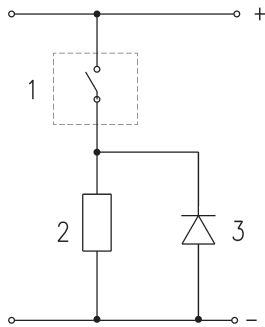
 H = operational hysteresis of the sensor with respect to the form and amplitude of the magnetic field  
 b = contact stroke in mm


Series	Ø	b ( mm )	H ( mm )	Series	Ø	b ( mm )	H ( mm )	Series	Ø	b ( mm )	H ( mm )
<b>24-25</b>	16	9,2	1,2	<b>60</b>	32	9,9	1	<b>62</b>	32	10	1
<b>24-25</b>	20	12	1	<b>60</b>	40	8,9	1,2	<b>62</b>	40	11	1
<b>24-25</b>	25	11,7	1,1	<b>60</b>	50	10,7	1	<b>62</b>	50	12	1,2
<b>27</b>	20	10,5	1,6	<b>60</b>	63	12,9	1,2	<b>62</b>	63	13	1
<b>27</b>	25	10,9	1,6	<b>60</b>	80	11,5	1,4	<b>62</b>	80	13	1
<b>27</b>	32	10,7	1,1	<b>60</b>	100	14,9	1,4	<b>62</b>	100	16	1
<b>27</b>	40	12,1	1,7	<b>60</b>	125	22	1				
<b>27</b>	50	12,1	1,2	<b>61</b>	32	9	1				
<b>27</b>	63	14,1	1,3	<b>61</b>	40	9,3	1,3				
<b>QP</b>	12	10	1,3	<b>61</b>	50	11	1,6				
<b>QP</b>	16	11,8	1,5	<b>61</b>	63	13,4	1,3				
<b>QP</b>	20	11,1	1,6	<b>61</b>	80	13,2	1,6				
<b>QP</b>	25	10,6	1,6	<b>61</b>	100	15,2	1,7				
<b>QP</b>	32	12,7	1,2	<b>61</b>	125	22,1	1,3				
<b>QP</b>	40	12,5	1,1	<b>42</b>	32	10,8	1,5				
<b>QP</b>	50	15,4	1,6	<b>42</b>	40	11,2	1,6				
<b>QP</b>	63	16,7	1,5	<b>42</b>	50	12,6	1,7				
<b>QP</b>	80	13,2	1,7	<b>42</b>	63	14,1	1,7				
<b>QP</b>	100	16,8	1,8	<b>QCT</b>	20	10	1,7				
<b>31</b>	12	9,2	1,4	<b>QCT</b>	25	11,4	1,8				
<b>31</b>	16	7,9	1,3	<b>QCT</b>	32	12,1	1,8				
<b>31</b>	20	9,1	1,5	<b>QCT</b>	40	12,4	1,8				
<b>31</b>	25	10,6	1,5	<b>QCT</b>	50	13,7	1,9				
<b>31</b>	32	11,9	1,7	<b>QCT</b>	63	13,5	1,8				
<b>31</b>	40	12,9	2,2	<b>69</b>	32	34,5	3,8				
<b>31</b>	50	14,7	1,2	<b>69</b>	40	29,6	4,1				
<b>31</b>	63	15,2	1,4	<b>69</b>	50	31,5	4,6				
<b>31</b>	80	16,6	1,8	<b>69</b>	63	32,3	3,1				
<b>31</b>	100	16,8	1,7	<b>69</b>	80	24	2,9				
<b>40</b>	160	24	2	<b>69</b>	100	25,6	2,9				
<b>40</b>	200	26	2	<b>69</b>	125	30,1	1,7				

**Load curves**



## 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 circuit with protection against the voltage spikes. See picture above for a typical example.

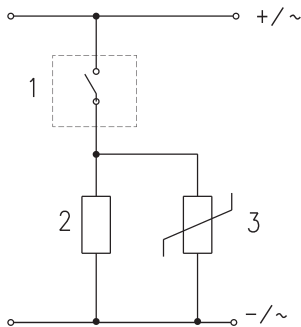
Legend:

1 = Sensor

2 = Load

3 = Protection diode

## Electric circuit with protection against voltage spikes



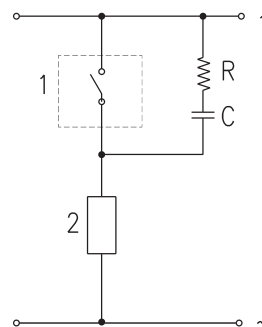
DC and AC applications: there is no protection on the Reed sensors on the inductive load, therefore it is advisable to use an electric circuit with protection against the voltage spikes. See picture above for a typical example.

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

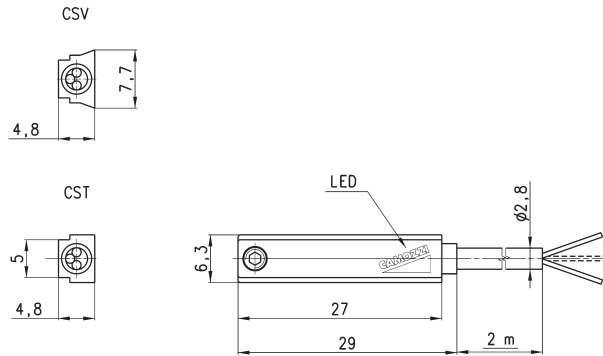
Series CST-CSV magnetic proximity switches with 2/3-wire cable

Length cable: 2 m or 5 m

\* = Mod. CST-220 and CSV-220 suitable up to 230 V AC.



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



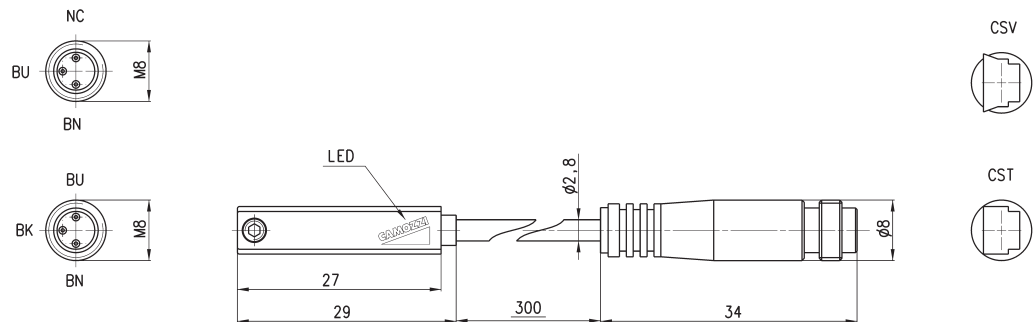
Mod.	Operation	Connections	Voltage (V)	Output	Max. current	Max Load	Protection
<b>CST-220</b>	Reed	2 wires	10 + 110 AC/DC *	-	250 mA	10VA/8W	None
<b>CSV-220</b>	Reed	2 wires	10 + 110 AC/DC *	-	250 mA	10VA/8W	None
<b>CST-220-5</b>	Reed	2 wires	10 + 110 AC/DC *	-	250 mA	10VA/8W	None
<b>CST-232</b>	Reed	3 wires	5 + 30 AC/DC	PNP	250 mA	10VA/8W	Against polarity reversing
<b>CSV-232</b>	Reed	3 wires	5 + 30 AC/DC	PNP	250 mA	10VA/8W	Against polarity reversing
<b>CST-332</b>	Electronic	3 wires	10 + 27 DC	PNP	100 mA	6W	Against polarity reversing and overvoltage
<b>CSV-332</b>	Electronic	3 wires	10 + 27 DC	PNP	100 mA	6W	Against polarity reversing and overvoltage

Series CST-CSV magnetic proximity switches with male connector M8

Length cable 0,3 mt.



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



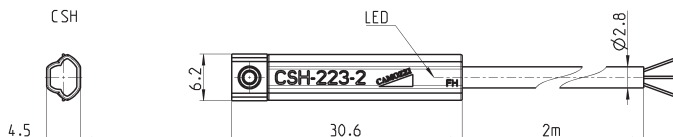
Mod.	Operation	Connections	Voltage (V)	Output	Max. current	Max Load	Protection
<b>CST-250N</b>	Reed	2 wires with M8 connector	10 + 110 AC/DC	-	250 mA	10VA/8W	None
<b>CSV-250N</b>	Reed	2 wires with M8 connector	10 + 110 AC/DC	-	250 mA	10VA/8W	None
<b>CST-262</b>	Reed	3 wires with M8 connector	5 + 30 AC/DC	PNP	250 mA	10VA/8W	Against polarity reversing
<b>CSV-262</b>	Reed	3 wires with M8 connector	5 + 30 AC/DC	PNP	250 mA	10VA/8W	Against polarity reversing
<b>CST-362</b>	Electronic	3 wires with M8 connector	10 + 27 DC	PNP	100 mA	6W	Against polarity reversing and overvoltage
<b>CSV-362</b>	Electronic	3 wires with M8 connector	10 + 27 DC	PNP	100 mA	6W	Against polarity reversing and overvoltage

### Series CSH magnetic proximity switches with 2/3-wire cable

For max. operating current see load curves diagrams.



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



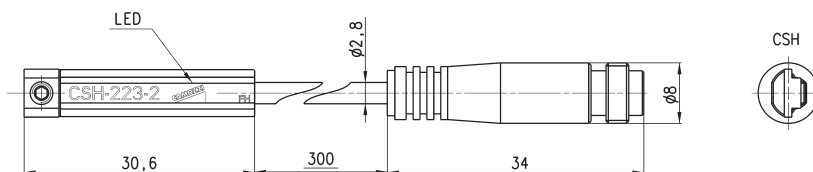
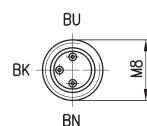
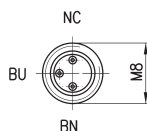
Mod.	Operation	Connections	Voltage (V)	Output	Max current	Max Load	Protection
CSH-223-2	Reed	2 wires	10 + 30 AC/DC	-	250 mA	10VA/8W	Against polarity reversing
CSH-223-5	Reed	2 wires	10 + 30 AC/DC	-	250 mA	10VA/8W	Against polarity reversing
CSH-221-2	Reed	2 wires	30 + 230 AC - 30 + 110 DC	-	250 mA	10VA/8W	Against polarity reversing
CSH-221-5	Reed	2 wires	30 + 230 AC - 30 + 110 DC	-	250 mA	10VA/8W	Against polarity reversing
CSH-233-2	Reed	3 wires	10 + 30 AC/DC	PNP	250 mA	10VA/8W	Against polarity reversing
CSH-233-5	Reed	3 wires	10 + 30 AC/DC	PNP	250 mA	10VA/8W	Against polarity reversing
CSH-334-2	Electronic	3 wires	10 + 27 DC	PNP	250 mA	6W	Against polarity reversing and overvoltage
CSH-334-5	Electronic	3 wires	10 + 27 DC	PNP	250 mA	6W	Against polarity reversing and overvoltage

### Series CSH magnetic proximity switches with male connector M8

For max. operating current see load curves diagrams.



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

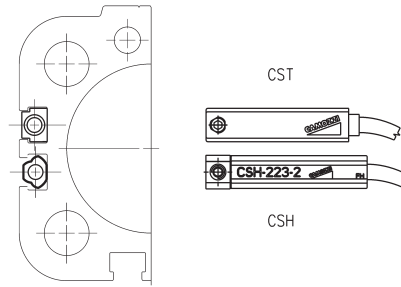


Mod.	Operation	Connections	Voltage (V)	Output	Max current	Max Load	Protection
CSH-253	Reed NO	2 wires with M8 connector	10 + 30 AC/DC	-	250 mA	10VA/8W	Against polarity reversing
CSH-263	Reed NO	3 wires with M8 connector	10 + 30 AC/DC	PNP	250 mA	10VA/8W	Against polarity reversing
CSH-364	Electronic	3 wires with M8 connector	10 + 27 DC	PNP	250 mA	6W	Against polarity reversing and overvoltage
CSH-463	Reed NC	3 wires with M8 connector	10 + 30 AC/DC	PNP	250 mA	10VA/8W	Against polarity reversing



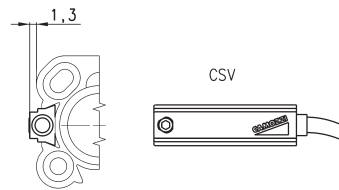
### Sensors Series CST - CSH

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



### Series CSV Sensors

CSV sensors must be assembled directly into the groove of cylinders:  
 Series 50  $\varnothing$  16+25  
 Series QP - QPR  $\varnothing$  12+16

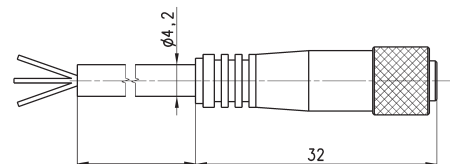
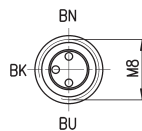


### Circular connectors M8, 3 Pin Female

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



BN = Brown  
 BK = Black  
 BU = Blue

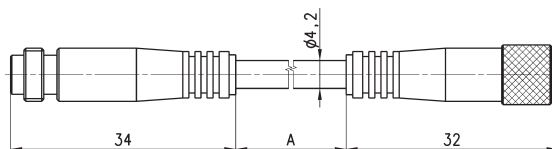


In case of the use of sensors with two wires with connector M8 models CST-250N, CSV-250N, CSH-253 connect the brown wire to the input (+) and the black wire to the load.

Mod.	Length
CS-2	2 m
CS-5	5 m
CS-10	10 m

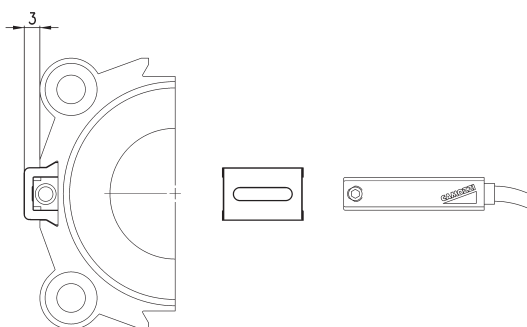
## Extension with connector M8, 3 Pin Male / Female

Non shielded



Mod.	cable length "A" (mt)
S-DW03HB-C250	2,5
S-DW03HB-C500	5

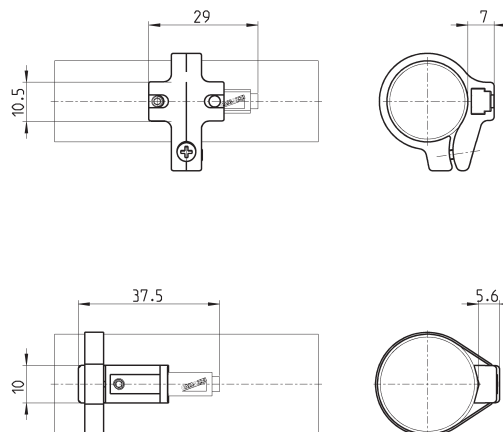
## Mounting brackets for sensors Series CST-CSH



Mod.	Cylinders series	Ø
S-CST-01	QP-QPR	20 + 100
S-CST-01	50	32 + 80

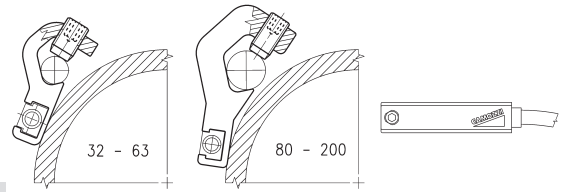
## Mounting brackets for sensors Series CST - CSH

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



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

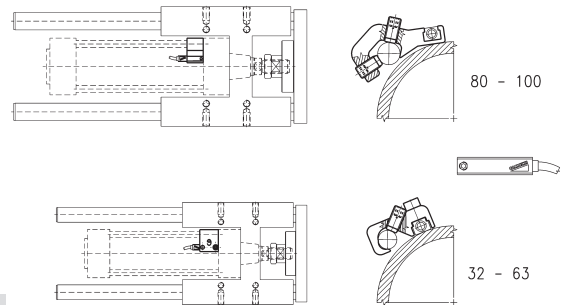
Mounting brackets for sensors Series CST and CSH



Mod.	Cylinders series	Ø
<b>S-CST-25</b>	60	32 ÷ 63
<b>S-CST-26</b>	60	80-100
<b>S-CST-27</b>	60	125
<b>S-CST-28</b>	40	160-200

Mounting brackets for sensors Series CST and CSH

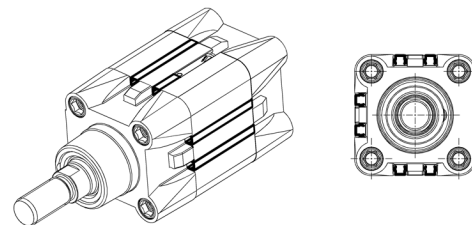
For cylinders series 60 mounted with guides series 45NHT or 45NHB.



Mod.	Cylinders series	Ø
<b>S-CST-45N1</b>	60	32 ÷ 63
<b>S-CST-45N2</b>	60	80-100

Slot cover profile Mod. S-CST-500

Supplied with 500 mm tube



Slot cover profile for cylinders Series: 31 - 31 tandem and multi-position - QCT - QCB - QCBT-QCBF - 61 - 69 - 32 - 32 tandem and multi-position.

Mod.
<b>S-CST-500</b>