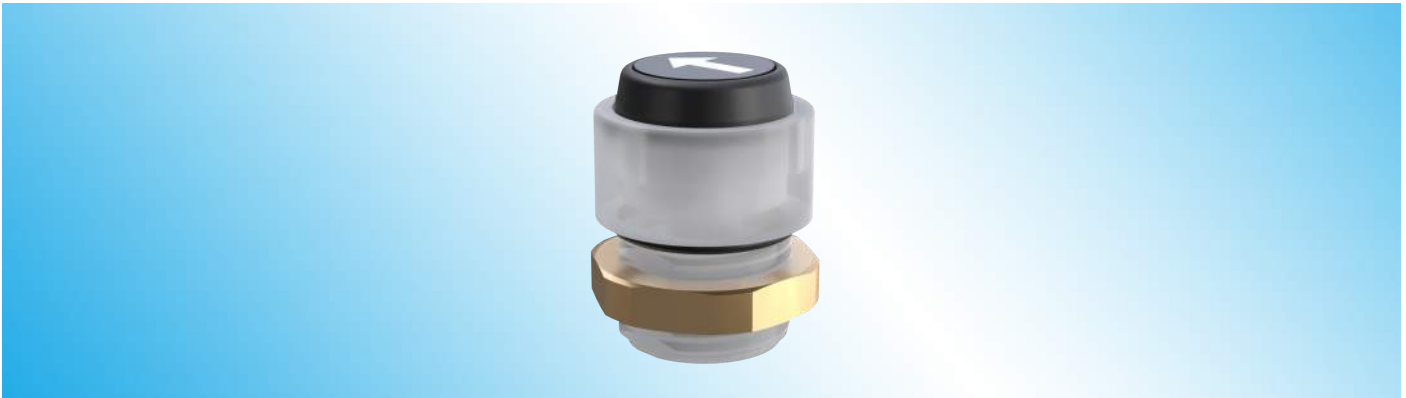


MO 392.H2X



Product Characteristics

Technology	Non-Contact Hall Switch (Low Side Output - NO)
Lifetime at Full Stroke	Up to 2 Million Cycles
Mounting	M12x1 Thread with Locking Nut
Other Specification	Blue Night Illumination and Red Function Illumination, Sealed Housing (No LEDs for H1W)
Options	Customized Color Options, Customized Symbol Options
Operating Temperature	-40°C ... +85°C
Ingress Protection	IP6K9K Electronic / IP54 Mechanical
Max Allowable Cable Pull Force	50 N

Electrical Data

Supply Voltage	H20: 5VDC ($\pm 0.5V$) , H21: 12VDC ($\pm 3V$), H22: 24VDC ($\pm 4V$)
Supply Current (No Load)	5 mA (typ.) / 10 mA (max.)
Output Current	500 mA (max.)
Overvoltage	H20: 14V, H21: 22V, H22: 30V during 1 hour
Reverse Battery Voltage	-10V max. during 1 hour

Environment

Chemical Load	ISO 16750-5 : Diesel, engine oil, hydraulic fluid, grease, brake fluid, antifreeze fluid, urea, windscreen washer fluid, vehicle washing chemicals, cola, coffee, NPK fertilizer.
Damp Heat Steady	DIN EN 60068-2-78 : 40°C, 85% RH, 96h
Damp Heat, Cyclic	DIN EN 60068-2-30 : Between 25 / 55°C, 95% RH, 24h/cyc, 6cyc
Cold	DIN EN 60068-2-1 : -40°C, 48h
Dry Heat	DIN EN 60068-2-2 : +85°C, 48h
Change of Temperature	DIN EN 60068-2-14 : Between -40 / 85°C, 8h/cyc, 30cyc
Mechanical Shock	DIN EN 60068-2-27 : 40g, 6ms, 1000 times per plane x, y, z
Vibration Sinusoidal	DIN EN 60068-2-6 : 40g, 0,32m/s, 8h per plane x, y, z
Vibration Random	DIN EN 60068-2-64 : 5,8g, 10-2000Hz, 8h per plane x, y, z
Free Fall	DIN IEC 60068-2-32 : 1m free fall to concrete ground, 2 times per plane x, y, z
Water Jet	DIN 40050 Part 9 : Electronic IP 6K9K, Mechanical IP 54
Dust	DIN 40050 Part 9 : Electronic IP 6K9K, Mechanical IP 54
Immersion	DIN 40050 Part 9 : Electronic IP 67
Salt Spray	DIN EN 60068-2-11 : 504 hours

All the tests specified above were performed in Makersan's in-house testing facility for the purpose of design verification except EMC. The in-house testing facility does not hold an accreditation. Rev D - Jul. 2022/1

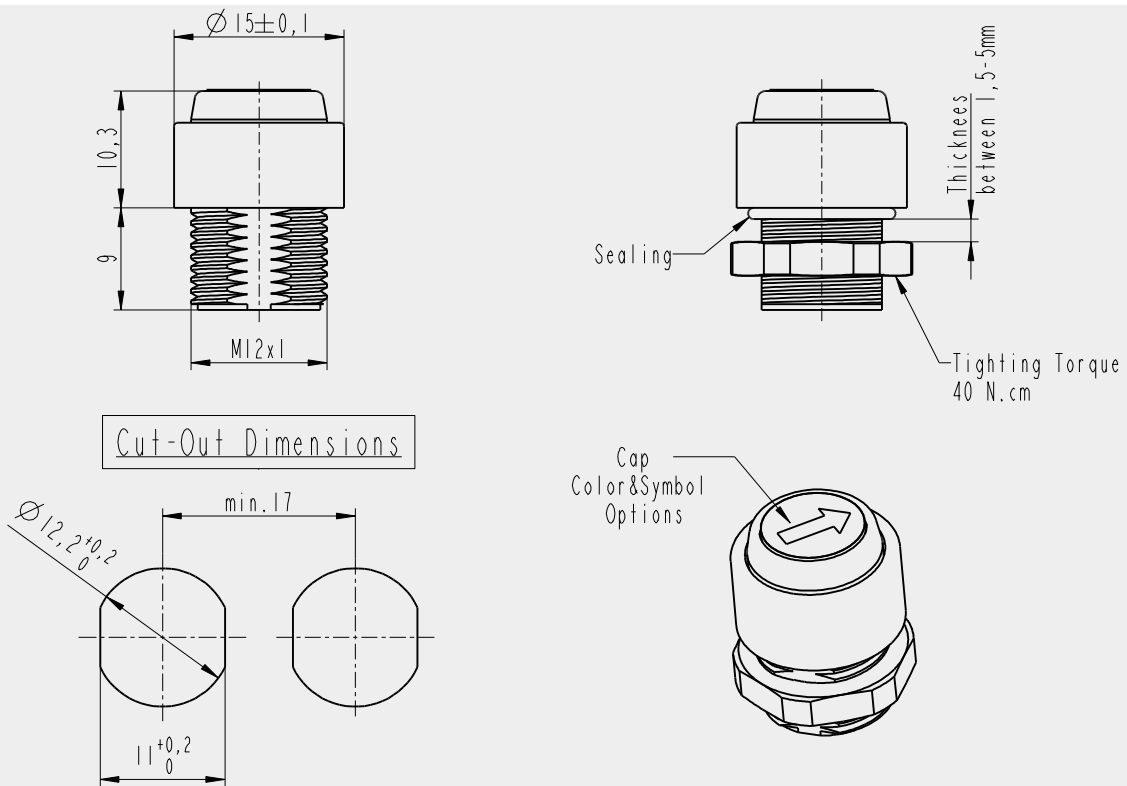
MO 392.H2X

Electrical Connection



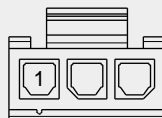
1	Vs	Red	H20	+5V	or	H21	+12V	or	H22	+24V
2	Out		Yellow - 5V							
			Gray - 12V							
			White - 24V							
3	Gnd	Black								

Technical Drawing



Connector Options

Molex - Micro Fit-3



Mating Connector
43640-0300

MO 392.H2X

Symbol Options

Code	Symbol	Description	Code	Symbol	Description
P001		RAL 9003 Signal white	P051		Background color: RAL 7043 Legend color: RAL 9003 Arrow
P002		RAL 3001 Signal red	P501		Background color: RAL 7043 Legend color: RAL 9003 Arrow
P003		RAL 5005 Signal blue	P502		Background color: RAL 9005 Legend color: RAL 9003 Differential Lock
P004		RAL 6010 Grass green	P503		Background color: RAL 9005 Legend color: RAL 9003 Horn
P005		RAL 1023 Traffic yellow	P504		Background color: RAL 9005 Legend color: RAL 9003
P006		RAL 2010 Signal orange			
P007		RAL 9005 Jet black			
P008		RAL 7043 Traffic grey B			

Ordering Code

MO 392 - H2X - PXXX - XX

Hardware Configurations
H20 - 5V H21 - 12V H22 - 24V
*

Symbol Option
P001- RAL 9003
See symbol table for symbol codes.
**

Connection
00- 250mm Loose Cable (AWG 24)
01- Molex Micro-Fit Connector 250mm Cable

* 5V supply voltage and blue night / red function light is standard, other configs are available upon request with minimum order quantity.

** For other available symbols please see "Symbol Options".

*** 250mm loose cable is standard, other connections are available upon request with minimum order quantity.

Example: MO 392-H20-P001-00 is Push Button, 5V Supply Voltage and Blue Night / Red Function Light, RAL 9003 Cap and 250mm Loose Cable.

MO 392.H2X

Safety Instructions

- *Do not use switch in hazardous and explosive environment.
- *Keep the switch away from radio equipment .
- *Do not place the switch to the direct air flow of vehicles heating cooling air duct due to the high temperature stress.
- *Screen with the vehicle's ground the electric cables connected to switch.Far away the switch cable from power-conducting lines.
- *Provide a clean power supply to the switch. Otherwise voltage transients may damage the switch.
- *Do not direct the pressure washing jet to switch.
- *Unplug connectors from the switch during electrical welding operations.
- *Damages which result from improper use, all warranty and liability claims with respect to the manufacturer void.
- *To perform a risk analysis of the system is customer's responsibility at use in safety-related functions of the switch.
- *These products are ESD (Electrostatic Discharge) sensitive devices. ESD may cause permanent damage. When handling these devices please observe standard ESD precautions.

MO 392.H1X



Product Characteristics

Technology	Non-Contact Hall Switch (Low Side Output - NO)
Lifetime at Full Stroke	Up to 2 Million Cycles
Mounting	M12x1 Thread with Locking Nut
Other Specification	Blue Night Illumination and Red Function Illumination, Sealed Housing (No LEDs for H1W)
Options	Customized Color Options, Customized Symbol Options
Operating Temperature	-40°C ... +85°C
Ingress Protection	IP6K9K Electronic / IP54 Mechanical
Max Allowable Cable Pull Force	50 N

Electrical Data

Supply Voltage	H10: 5VDC ($\pm 0.5V$), H11: 12VDC ($\pm 3V$), H12: 24VDC ($\pm 4V$), H1W: 5-24VDC
Supply Current (No Load)	5 mA (typ.) / 10 mA (max.)
Output Current	10 mA (max.)
Overvoltage	<u>H10</u> : 14V, <u>H11</u> : 22V, <u>H12</u> : 30V, <u>H1W</u> : 30V during 1 hour
Reverse Battery Voltage	-10V max. during 1 hour

Environment

Chemical Load	ISO 16750-5 : Diesel, engine oil, hydraulic fluid, grease, brake fluid, antifreeze fluid, urea, windscreen washer fluid, vehicle washing chemicals, cola, coffee, NPK fertilizer.
Damp Heat Steady	DIN EN 60068-2-78 : 40°C, 85% RH, 96h
Damp Heat, Cyclic	DIN EN 60068-2-30 : Between 25 / 55°C, 95% RH, 24h/cyc, 6cyc
Cold	DIN EN 60068-2-1 : -40°C, 48h
Dry Heat	DIN EN 60068-2-2 : +85°C, 48h
Change of Temperature	DIN EN 60068-2-14 : Between -40 / 85°C, 8h/cyc, 30cyc
Mechanical Shock	DIN EN 60068-2-27 : 40g, 6ms, 1000 times per plane x, y, z
Vibration Sinusoidal	DIN EN 60068-2-6 : 40g, 0,32m/s, 8h per plane x, y, z
Vibration Random	DIN EN 60068-2-64 : 5,8g, 10-2000Hz, 8h per plane x, y, z
Free Fall	DIN IEC 60068-2-32 : 1m free fall to concrete ground, 2 times per plane x, y, z
Water Jet	DIN 40050 Part 9 : Electronic IP 6K9K, Mechanical IP 54
Dust	DIN 40050 Part 9 : Electronic IP 6K9K, Mechanical IP 54
Immersion	DIN 40050 Part 9 : Electronic IP 67
Salt Spray	DIN EN 60068-2-11 : 504 hours

EMC/ESD

EMC	ECE-R10 Rev.5
ESD	ISO 10605
Load Dump	ISO 7637-2 Pulse 5b (H11, H12)
<small>All the tests specified above were performed in Makersan's in-house testing facility for the purpose of design verification except EMC. The in-house testing facility does not hold an accreditation. Rev D - Jul. 2022/1</small>	

C+R Automations- GmbH

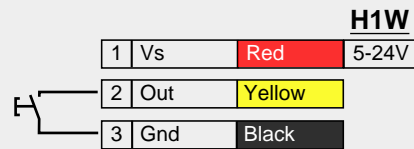
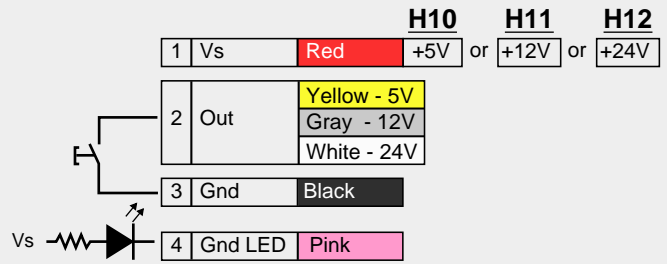
Nürnberg Straße 45
90513 Zirndorf

Tel. +49 (0)911 656587-0
Fax +49 (0)911 656587-99

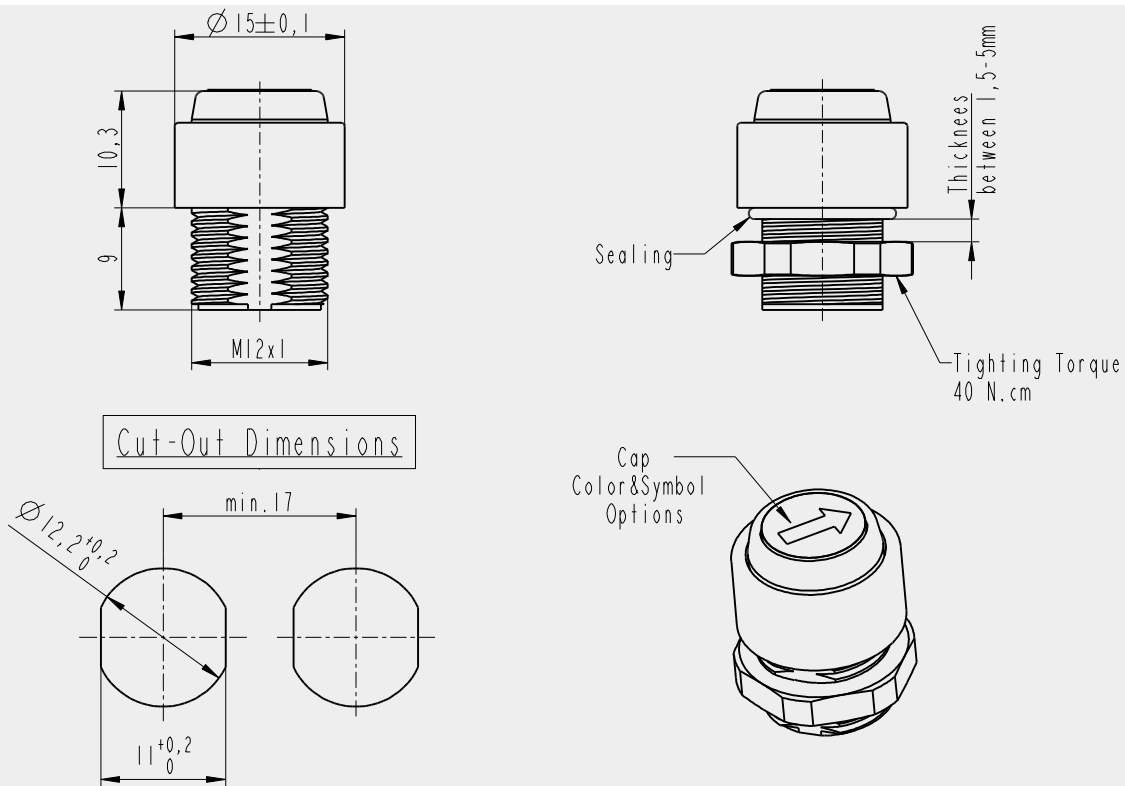
E-Mail: info@crautomation.de Änderungen vorbehalten
www.crautomation.de

MO 392.H1X

Electrical Connection

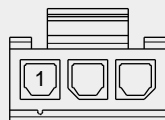


Technical Drawing



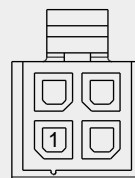
Connector Options

Molex - Micro Fit-3



Mating Connector:
43640-0300

Molex - Micro Fit-4



Mating Connector:
43020-0400

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Änderungen vorbehalten

MO 392.H1X

Symbol Options

Code	Symbol	Description	Code	Symbol	Description
P001		RAL 9003 Signal white	P051		Background color: RAL 7043 Legend color: RAL 9003 Arrow
P002		RAL 3001 Signal red	P501		Background color: RAL 7043 Legend color: RAL 9003 Arrow
P003		RAL 5005 Signal blue	P502		Background color: RAL 9005 Legend color: RAL 9003 Differential Lock
P004		RAL 6010 Grass green	P503		Background color: RAL 9005 Legend color: RAL 9003 Horn
P005		RAL 1023 Traffic yellow	P504		Background color: RAL 9005 Legend color: RAL 9003
P006		RAL 2010 Signal orange			
P007		RAL 9005 Jet black			
P008		RAL 7043 Traffic grey B			

Ordering Code

MO 392 - H1X - PXXX - XX

Hardware Configurations	Symbol Option	Connection
H10 - 5V H11 - 12V H12 - 24V H1W - 5-24V (no LED) *	P001- RAL 9003 See symbol table for symbol codes. **	00- 250mm Loose Cable (AWG 24) 01- Molex Micro-Fit Connector 250mm Cable ***

* 5V supply voltage and blue night / red function light is standard, other configs are available upon request with minimum order quantity.

** For other available symbols please see "Symbol Options".

*** 250mm loose cable is standard, other connections are available upon request with minimum order quantity.

Example: MO 392-H10-P001-00 is Push Button, 5V Supply Voltage and Blue Night / Red Function Light, RAL 9003 Cap and 250mm Loose Cable.

MO 392.H1X

Safety Instructions

- *Do not use switch in hazardous and explosive environment.
- *Keep the switch away from radio equipment .
- *Do not place the switch to the direct air flow of vehicles heating cooling air duct due to the high temperature stress.
- *Screen with the vehicle's ground the electric cables connected to switch.Far away the switch cable from power-conducting lines.
- *Provide a clean power supply to the switch. Otherwise voltage transients may damage the switch.
- *Do not direct the pressure washing jet to switch.
- *Unplug connectors from the switch during electrical welding operations.
- *Damages which result from improper use, all warranty and liability claims with respect to the manufacturer void.
- *To perform a risk analysis of the system is customer's responsibility at use in safety-related functions of the switch.
- *These products are ESD (Electrostatic Discharge) sensitive devices. ESD may cause permanent damage. When handling these devices please observe standard ESD precautions.