MOBILE ELECTRONICS

TECHNICAL CATALOG

POCLAIN Hydraulics

Methodology :
This document is intended for manufacturers of machines that incorporate Poclain Hydraulics products. It describes the technical characteristics of Poclain Hydraulics products and specifies installation conditions that will ensure optimum operation.
This document includes important comments concerning safety. They are indicated in the following way :This document also includes essential

	**Safety comment.**

operating instructions for the product and general information. These are indicated in the following way:

	**Essential instructions.**
	**General information.**
	**Information on the model number.**
	**Weight of component without oil.**
	**Volume of oil.**
	**Units.**
	**Tightening torque.**
	**Screws.**
	**Information intended for Poclain-Hydraulics personnel.**

The views in this document are created using metric standards.
The dimensional data is given in mm and in inches (inches are given in brackets in italics). 
Associated documents

Document type	
Generic installation	B61352L

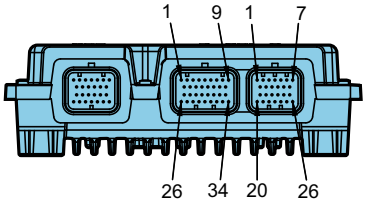
	**The components of this booklet are not reparable.**
	**Warranty reclaim of any disassembled components will not be accepted.**

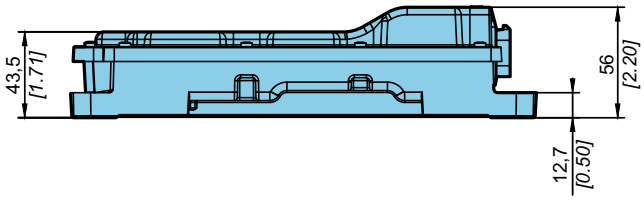
CONTENT

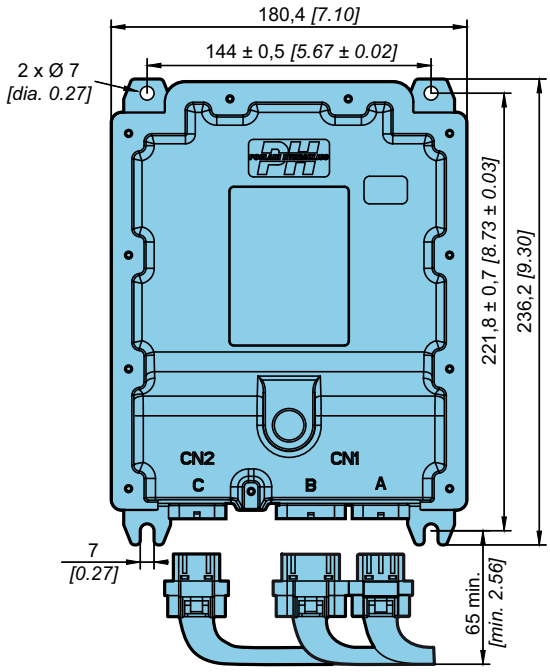
SMARTDRIVE™ CT ECU

Commercial name		SD-CT-200	SD-CT-300
Part number		A46841P	A46842Q
Operating voltage		8 V to 32 V	
Operating temperature		- 40°C to 85°C [-40 °F to 185°F]	
Overall dimensions		See below	
Material		- Aluminum $AlSi_9Cu_3$ (Box) - PA66 plastic with 20% of fiberglass (cap) - Silicon (seal)	
Mass		1,270 kg ±10% *[2,76 lb]* ±10%	
Mounting		4 x Ø 7 mm *4 x [0.275" dia.]*	
Controller Ingress Protection with counterpart connectors mounted		IP67 (according to EN60529 oct 1992)	
Max. quiescent current consumption (ignition switched off)		5 mA	
12V system max current		35,4 A	
24V system max current		17 A	
Maximum usage profile:	12V System: (Supply voltage 16V)	- 6 HSD PWM outputs 400Hz, 95% 8 Ω loads - 4 HSD digital outputs on, 6.15 Ω loads	- 8 HSD PWM outputs 400Hz, 95% 8 Ω loads - 4 HSD digital outputs on, 6.15 Ω loads - 4 HSD digital outputs on, 8Ω loads
	24V System: (Supply voltage 32V)	- 6 HSD PWM outputs 400Hz, 95% 32Ω loads - 4 HSD digital outputs on, 32Ω loads	- 8 HSD PWM outputs 400Hz, 95% 32Ω loads - 8 HSD digital outputs on, 32Ω loads
Performance level		Capacity to reach PL d level according to ISO13849:2015 standard	
Mean Time To Failure (MTTF)		85,1 years (ambient temperature of 40°C *[104°F]*) with operating profil of 11,87% (4 hours per day, 5 days per week, 52 weeks per year)	66,7 years (ambient temperature of 40°C *[104°F]*) with operating profil of 11,87% (4 hours per day, 5 days per week, 52 weeks per year)
Mean Time To Dangerous Failure (MTTFd)		224.2 years	173.1 years
Diagnostic Coverage (DC)		90,9% (medium)	90,7% (medium)
Category		2	2
Electrical protection		Over-voltage, reverse polarity, ground and battery short circuit	
Microcontroller		One 32 bits microcontroller and one 8 bits microcontroller	
ECU programming		Programming with a PC using the PHASES™-CT software application	
ECU set-up		Set-up with the software PHASES™-CT	
Universal inputs (UN)		9	15
Analog inputs (AN)		11	17
Frequency inputs (FIN)		5	8
Wake-Up Input (WUI)		1	1
Ground sense input (GND_SENSE)		1	1
HSD PWM 2A outputs		6	8
HSD DIG 2,6A outputs		4	4
HSD DIG 2A outputs		0	4
Low Side Digital output (LSD) 4A		0	3
Low Side Digital output (LSD) 5,2A		3	3
Sensor supply 5V		1	1

Overall dimensions of the ECU



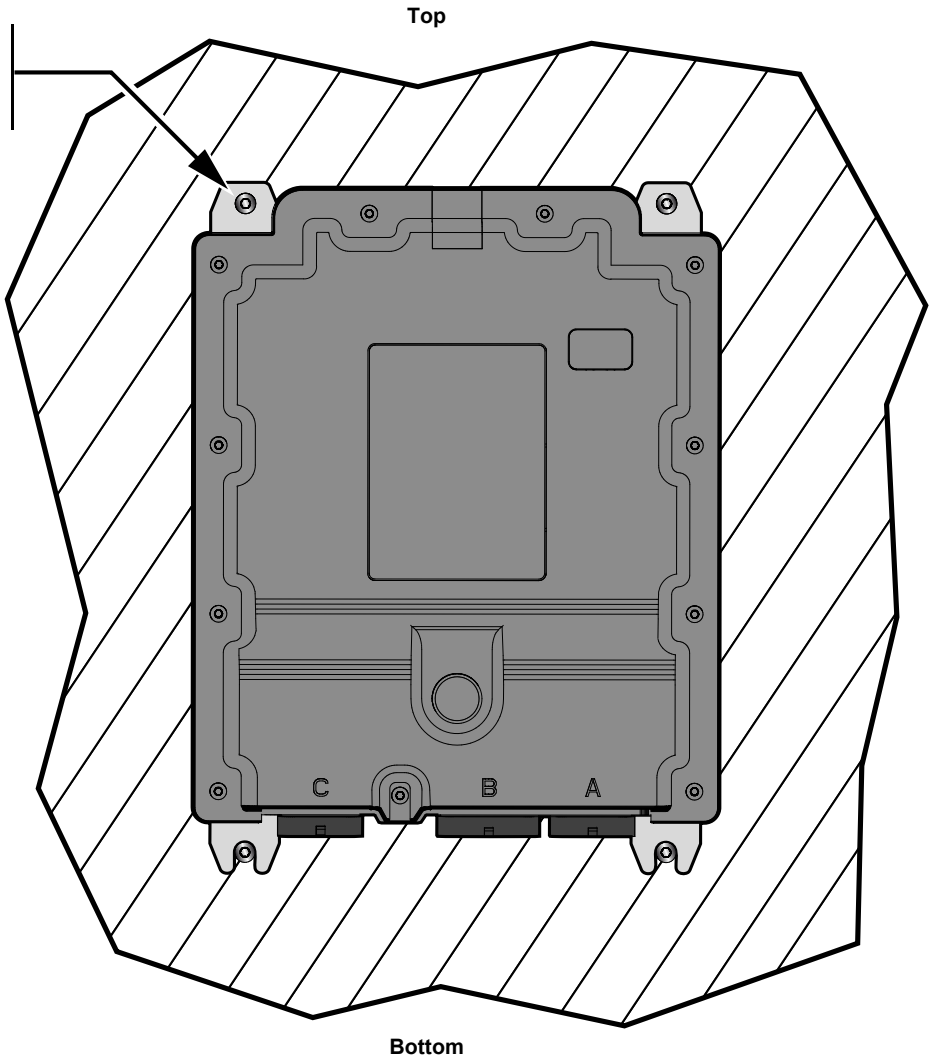




Fitting the controller

The controller must be fixed on a rigid support. Make sure that there is enough space to fit the connector (min. 65 mm *[min. 2.56 in]*).
The controller shall be preferably mounted in vertical position (connectors at the bottom) to enhance ventilation and avoid dust accumulation on cooling fins.
The controller's housing has to be connected to the ground (chassis) of the vehicle and to be installed on a flat surface (flatness of 0,5/ 100x100mm *[3.94x3.94 in]*).

Screw (X4): M6
Nut (x4): M6
Shim (x4) : M6
Tightening torque: 6 Nm



Electrical connections	Commercial name	Part number	
SmartDrive™ CT main connector	KIT-CONNECT-SD-CT-200	A48149L	page 45
	KIT-CONNECT-SD-CT-300	A48140B	
SmartDrive™ CT communication connector	KIT-CONNECT-COM-M-SD-CT	A48693C	page 47
Connector kit 120Ω	KIT-PLUG-120-DTM-2S	A52539H	page 49
SmartDrive™ CT-200 cable	CABLE-SD-CT-200-60-5000	A48878D	page 89
SmartDrive™ CT-300 cable	CABLE-SD-CT-300-86-5000	A48877C	page 64

SMARTDRIVE™ CT-30 ECU

Commercial name	SD-CT-30
Part number	B03822D
Operating voltage	8 V to 32 V
Operating temperature	- 40°C to 100°C *[-40 °F to 212°F]*
Overall dimensions	See next page
Material	- PA66 plastic with 30% of fiberglass - Silicon (potting)
Mass	0,225 kg ±10% *[0,496 lb]* ±10%
Mounting	3 x Ø 5,5 mm *3 x [0.217" dia.]*
Controller Ingress Protection with counterpart connectors mounted	IP6K9K (according to ISO 20653)
12V system max current	17 A
24V system max current	8,5 A
Performance level	Capacity to reach PL d level according to ISO13849:2015 standard
Mean Time To Failure (MTTF)	162 years (ambient temperature of 40°C *[104°F]*) with operating profil of 21% (8 hours per day, 229 days per year)
Mean Time To Dangerous Failure (MTTFd)	324 years
Diagnostic Coverage (DC)	95,4% (medium)
Category	2
Electrical protection	Over-voltage, reverse polarity (with fuse), ground and battery short circuit
ECU programming	Programming with a PC using the PHASES™-CT software application
ECU set-up	Set-up with the software PHASES™-CT
Universal inputs (UN)	2
Analog inputs (AN)	7
Digital inputs (DN)	5
HSD PWM outputs	4
HSD DIG 2,6A outputs	2
HSD DIG 0,5A outputs	2
Sensor supply 5V	1

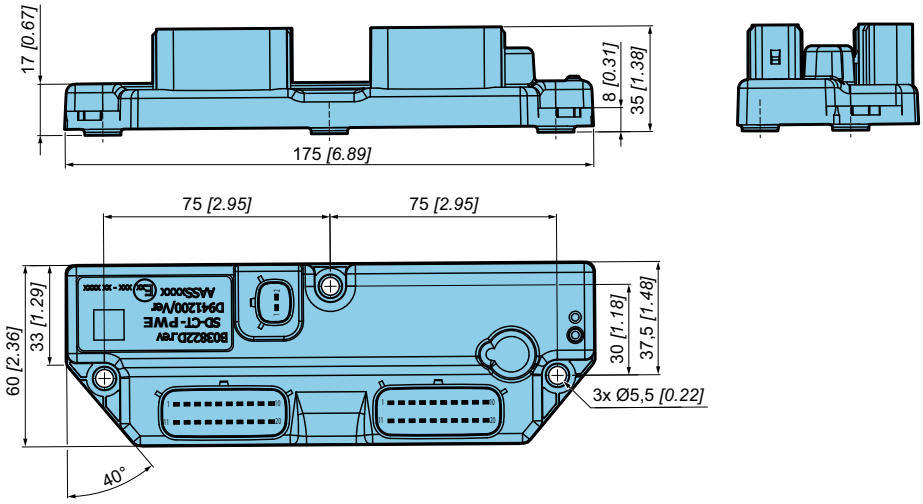
ESD and EMC:

Electromagnetic compatibility of vehicles is required by European Union. The vehicle manufacturers have to submit a technical file or a sample of their machine at a qualified service center certification.
The SmartDrive ™ CT controller passed with success the electromagnetic compatibility tests of electronic sub-assembly.

Type	Standard	Parameters
EC marking	2004/108/EC	
Electro-Magnetic Compatibility	EN/ISO14982:2009	Agricultural and forestry machines
Electro-Magnetic Compatibility	EN13309:2010	Construction machines
Electro-Magnetic Compatibility	EN12895:2000	Forklifts
E marking	ECE-R10	Automotive EMC directive

On demand Poclain Hydraulics will deliver list and severity levels of EMC tests.

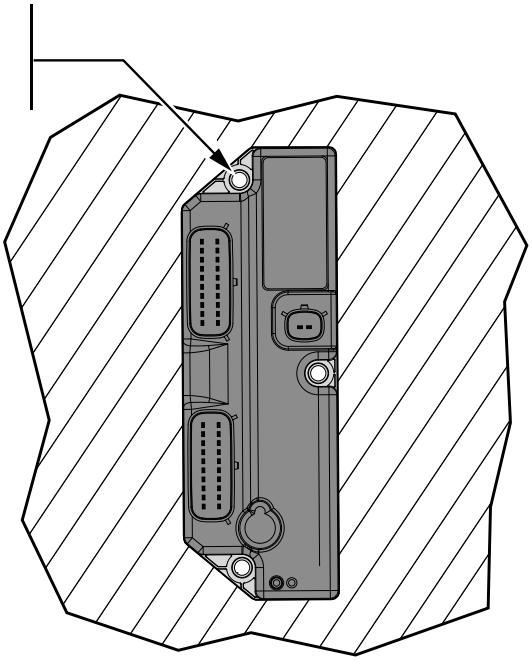
Overall dimensions of the ECU



Fitting the controller

The controller must be fixed on a rigid support. Make sure that there is enough space to fit the connector (min. 65 mm *[min. 2.56 in]*).
The controller's housing has to be connected to the ground (chassis) of the vehicle and to be installed on a flat surface (flatness of 0,5/ 100x100mm *[3.94x3.94 in]*).

Screw (3x): M5
Nut (3x): M5
Shim (3x) : M5
Tightening torque: 5±0,5 Nm



Electrical connections	Commercial name	Part number	
Connector 1	KIT-CONNECT-PWE-CUSTOMER	B03982C	
Connector 2	KIT-CONNECT-PWE-CUSTOMER-GREY	B18082D	
Connector 3	KIT-CONNECT-PWE-DIAG	B03983D	
SmartDrive™ CT communication connector	KIT-CONNECT-COM-M-SD-CT	A48693C	page 47
Connector kit 120Ω	KIT-PLUG-120-DTM-2S	A52539H	page 49
SmartDrive™ CT-30 cable	CABLE-SD-CT30-BLACK-20-5000	B35004W	

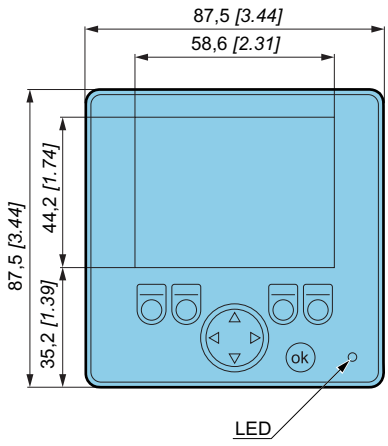
DISPLAY 2.8-CR0451

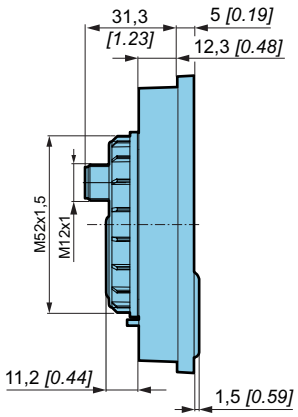
SD Display 2.8-CR0451	
Function	Displays informations (engine or pump RPM, pressure, error codes and their designations...)
Part number	B56556X

Features		
Electrical data	DC power supply	8 to 32 V
	Current consumption at 24 V	70 mA (100% background illumination)
	Display size	2,8”
	Display type	LCD TFT color, 320x240 pixels
	Keys	9 (illuminated)
Mechanical data	Operating temperature	- 20 °C to + 70 °C *[-4 °F to 158 °F]*
	Weight	170 g *[0.37 lb]*
	Mounting	Surface hole Ø 53mm *[dia. 2.10 in]* or panel mounting
	Degree of protection	IP67 on the front; IP65 on the back
Interfaces / Protocols	CAN	1 (ISO 11898, 2.0B)
	Layer 2, CANopen, J1939	✔

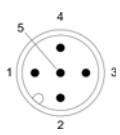
Accessory	Commercial name	Part number	
5 pin M12 cable	CABLE-M12-180°-2000-5PT	A19974L	page 71
5 pin M12 120 Ohm cable	CABLE-COM-M12-CAN-120	A25657N	page 72
Panel mounting accessory	FIXA-SD-DISPLAY-2.8-EC0403	B56568L	

Layout





5-pin, M12 connector layout



Pin	Description
1	Not used
2	Power supply
3	Ground
4	CAN H
5	CAN L

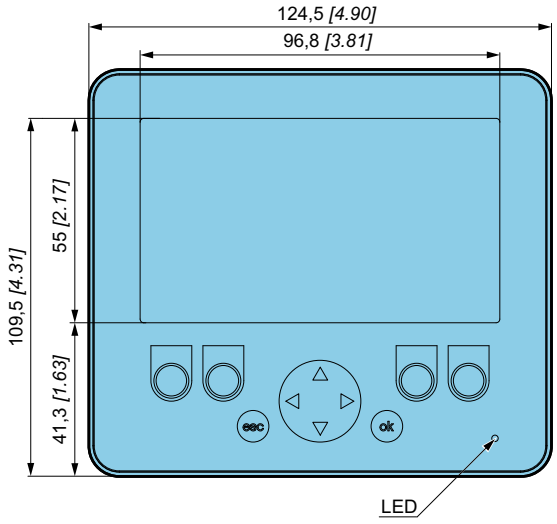
DISPLAY 4.3-CR0452

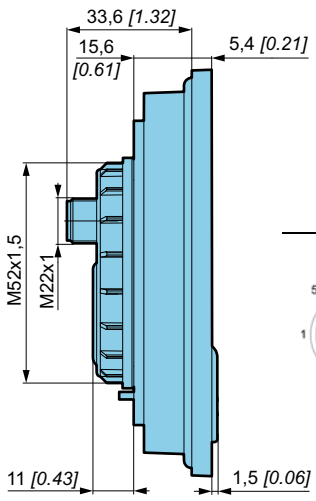
SD Display 4.3-CR0452	
Function	Displays informations (engine or pump RPM, pressure, error codes and their designations…)
Part number	B50721F

Features		
Electrical data	DC power supply	8 to 32 V
	Current consumption at 24 V	100 mA (100% backround illumination)
	Display size	4,3”
	Display type	LCD TFT color, 480x272 pixels
	Keys	10 (illuminated)
Mechanical data	Operating temperature	- 20 °C to + 65 °C *[-4 °F to 149 °F]*
	Weight	220 g *[0.48 lb]*
	Mounting	Surface hole Ø 53mm *[dia. 2.10 in]* or panel mounting
	Degree of protection	IP67 on the front; IP65 on the back
Interfaces / Protocols	CAN	1 (ISO 11898, 2.0A/B)
	Layer 2, CANopen, J1939	✔

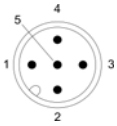
Accessory	Commercial name	Part number	
5 pin M12 cable	CABLE-M12-180°-2000-5PT	A19974L	page 71
5 pin M12 120 Ohm cable	CABLE-COM-M12-CAN-120	A25657N	page 72
Panel mounting accessory	FIXA-SD-DISPLAY-4.3-EC0404	B52120B	

Layout





5-pin, M12 connector layout



Pin	Description
1	Not used
2	Power supply
3	Ground
4	CAN H
5	CAN L

SPEED SENSOR T4

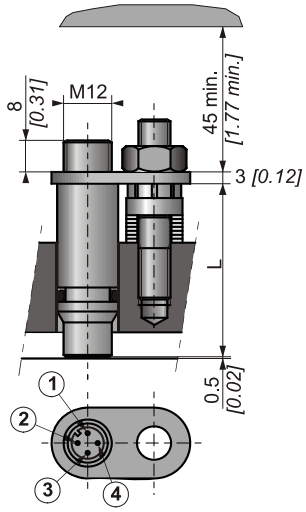
✔ **No detection of the rotation direction.**

Commercial name	**SPD-SENS-T4-12-44**	**SPD-SENS-T4-12-53**	**SPD-SENS-T4-12-62**
Part number (brass housing)	B45932A	B45933B	B45934C
Part number (stainless steel housing)	B61287Q	B61288R	B61289S
Lenght **L**(*)	44 *[1.73]*	53 *[2.09]*	62 *[2.44]*
Function	Detect movements: rotation speed		
Compatibility	Electronic transmission management		

(*) : According to the size of the motor, consult your Poclain Hydraulics sales engineer

Features	
Supply voltage	8 - 32 V
Output type	- 1 push-pull square frequency signal - Maximum load current: 20 mA - Voltage at low state: < 1.5 V - Voltage at high state: > (power supply voltage - 3.5 V)
Signal type	Frequenc 
Maximum range	1.15 mm *[0.045"]*
Current consumption	20 mA max.
Frequency range	0 to 15 kHz
Operating temperature	- 40°C to + 125°C *[- 40°F to 257°F]*
Material	Brass or stainless steel housing
Protection rating	IP68 (sensitive side) / IP67 (connector side)
Electrical protection	Protected against reverse polarity, short circuit to ground and supply
Mean Time To Failure (MTTF)	1 338 years with operating profile of 21% (8h per day, 229 days per year) Calculated according ISO13849-1 with component database SN29500
Mean Time To Dangerous Failure (MTTFd)	2 677 years

Layout



Installation

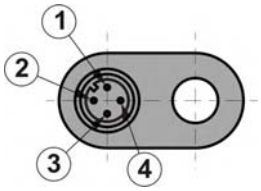
Disconnecting the accessories and speed set up

In the case of motors predisposed to speed, the existing shutter needs to be removed and eliminated before installing the sensor and its attachment device.

To install the sensor, see the "Installation guide" brochure No. B61352L.

Connection of the speed sensor

Remove the plastic plug on the connector.



Function	Pin number
Power supply	1
Not present	2
Ground	3
Square frequency signal	4

For the connection of connectors, please refer to the connection table and the general cabling plan contained in the installation brochure for your transmission.

Electrical connections	90°	180°
Commercial name	ELEC-CABLE-M12-90°-5000	ELEC-CABLE-M12-180°-5000
Part number	A04999J	A07468S
	page 70	page 70

In case of using an M12 90° cable (A04999J), pay attention to the alignment of the elbow with the sensor´s bracket to avoid twisting the sensor´s connector pins.

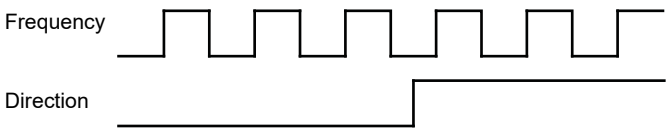
The M12 nut must be tightened with a tightening torque from 0.6 Nm (hand-tight) to 1.5 Nm (using a torque wrench). An excessive tightening can damage the M12 connector.

SPEED SENSOR TR

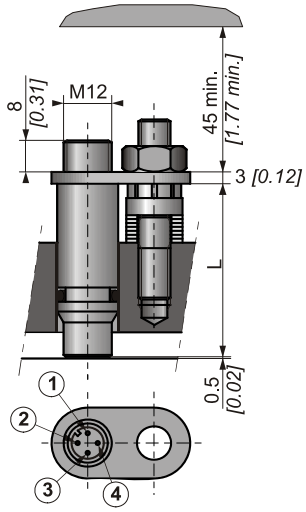
✔ **Detection of the rotation direction.**

Commercial name	**SPD-SENS-TR-12-44**	**SPD-SENS-TR-12-53**	**SPD-SENS-TR-12-62**
Part number (brass housing)	B45935D	B45936E	B45937F
Part number (stainless steel housing)	B61291U	B61292V	B61293W
Lenght **L**(*)	44 *[1.73]*	53 *[2.09]*	62 *[2.44]*
Function	Detect movements: rotation speed and rotation direction		
Compatibility	Electronic transmission management		

(*) : According to the size of the motor, consult your Poclain Hydraulics sales engineer

Features	
Supply voltage	8 - 32 V
Output type	- 1 push-pull square frequency signal - 1 push-pull direction signal - Maximum load current: 20 mA - Voltage at low state: < 1.5 V - Voltage at high state: > (power supply voltage - 3.5 V)
Signal type	
Maximum range	1.15 mm *[0.045"]*
Current consumption	20 mA max.
Frequency range	0 to 15 kHz
Instantaneous frequency deviation	10% with sensor mounted on Poclain Hydraulics motors
Operating temperature	- 40°C to + 125°C *[- 40°F to 257°F]*
Material	Brass or stainless steel housing
Protection rating	IP68 (sensitive side) / IP67 (connector side)
Electrical protection	Protected against reverse polarity, short circuit to ground and supply
Mean Time To Failure (MTTF)	717 years with operating profile of 21% (8h per day, 229 days per year) Calculated according ISO13849-1 with component database SN29500
Mean Time To Dangerous Failure (MTTFd)	1 434 years

Layout



Installation

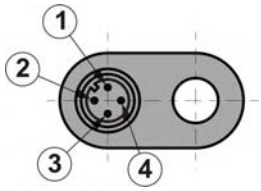
Disconnecting the accessories and speed set up

In the case of motors predisposed to speed, the existing shutter needs to be removed and eliminated before installing the sensor and its attachment device.

To install the sensor, see the "Installation guide" brochure No. B61352L.

Connection of the speed sensor

Remove the plastic plug on the connector.



Function	Pin number
Power supply	1
Direction signal	2
Ground	3
Square frequency signal	4

For the connection of connectors, please refer to the connection table and the general cabling plan contained in the installation brochure for your transmission.

Electrical connections	90°	180°
Commercial name	ELEC-CABLE-M12-90°-5000	ELEC-CABLE-M12-180°-5000
Part number	A04999J	A07468S
	page 70	page 70

In case of using an M12 90° cable (A04999J), pay attention to the alignment of the elbow with the sensor´s bracket to avoid twisting the sensor´s connector pins.

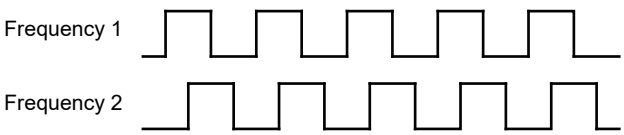
The M12 nut must be tightened with a tightening torque from 0.6 Nm (hand-tight) to 1.5 Nm (using a torque wrench). An excessive tightening can damage the M12 connector.

SPEED SENSOR TD

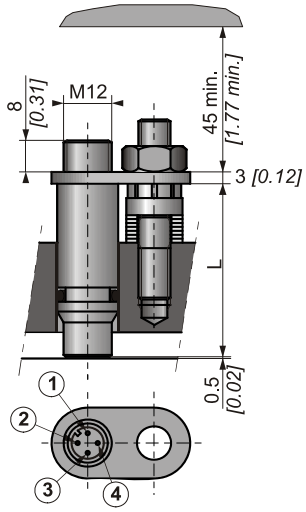
✔ **Detection of the rotation direction.**

Commercial name	**SPD-SENS-TD-12-44**	**SPD-SENS-TD-12-53**	**SPD-SENS-TD-12-62**
Part number (brass housing)	B45938G	B45939H	B45940J
Part number (stainless steel housing)	B61294X	B61295Z	B61296A
Lenght **L**(*)	44 *[1.73]*	53 *[2.09]*	62 *[2.44]*
Function	Detect movements: rotation speed and rotation direction		
Compatibility	Electronic transmission management		

(*) : According to the size of the motor, consult your Poclain Hydraulics sales engineer

Features	
Supply voltage	8 - 32 V
Output type	- 2 push-pull shifted square frequency signals (phase shift from 25° to 155°) - Maximum load current: 20 mA - Voltage at low state: < 1.5 V - Voltage at high state: > (power supply voltage - 3.5 V)
Signal type	
Maximum range	1.15 mm *[0.045"]*
Current consumption	20 mA max.
Frequency range	0 to 15 kHz
Instantaneous frequency deviation	10% with sensor mounted on Poclain Hydraulics motors
Operating temperature	- 40°C to + 125°C *[- 40°F to 257°F]*
Material	Brass or stainless steel housing
Protection rating	IP68 (sensitive side) / IP67 (connector side)
Electrical protection	Protected against reverse polarity, short circuit to ground and supply
Mean Time To Failure (MTTF)	717 years with operating profile of 21% (8h per day, 229 days per year) Calculated according ISO13849-1 with component database SN29500
Mean Time To Dangerous Failure (MTTFd)	1 434 years

Layout



Installation

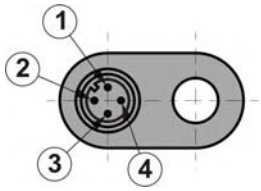
Disconnecting the accessories and speed set up

In the case of motors predisposed to speed, the existing shutter needs to be removed and eliminated before installing the sensor and its attachment device.

To install the sensor, see the "Installation guide" brochure No. B61352L.

Connection of the speed sensor

Remove the plastic plug on the connector.



Function	Pin number
Power supply	1
Square frequency signal n°2	2
Ground	3
Square frequency signal n°1	4

For the connection of connectors, please refer to the connection table and the general cabling plan contained in the installation brochure for your transmission.

Electrical connections	90°	180°
Commercial name	ELEC-CABLE-M12-90°-5000	ELEC-CABLE-M12-180°-5000
Part number	A04999J	A07468S
	page 70	page 70

In case of using an M12 90° cable (A04999J), pay attention to the alignment of the elbow with the sensor´s bracket to avoid twisting the sensor´s connector pins.

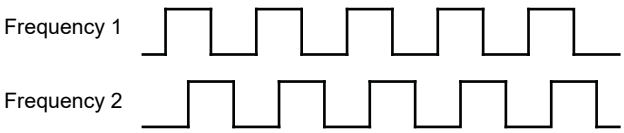
The M12 nut must be tightened with a tightening torque from 0.6 Nm (hand-tight) to 1.5 Nm (using a torque wrench). An excessive tightening can damage the M12 connector.

SPEED SENSOR TD WITH CABLE

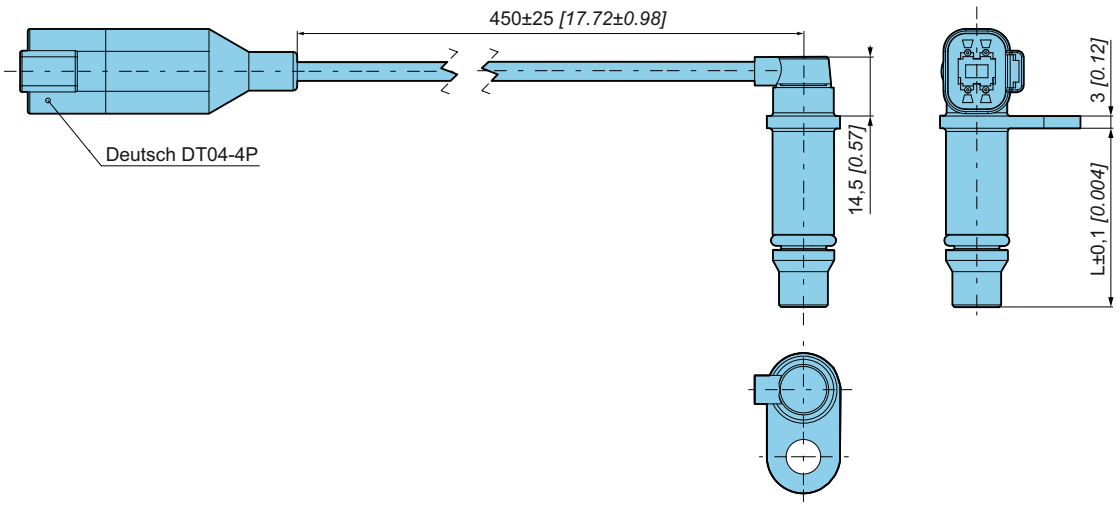
✔ **Detection of the rotation direction.**

Commercial name	**SPD-SENS-TD-12-44-L450**	**SPD-SENS-TD-12-53-L450**
Part number (brass housing)	B62903W	B62904X
Lenght **L**(*)	44 *[1.73]*	53 *[2.09]*
Function	Detect movements: rotation speed and rotation direction	
Compatibility	Electronic transmission management	

(*) : According to the size of the motor, consult your Poclain Hydraulics sales engineer

Features	
Supply voltage	8 - 32 V
Output type	- 2 push-pull shifted square frequency signals (phase shift from 25° to 155°) - Maximum load current: 20 mA - Voltage at low state: < 1.5 V - Voltage at high state: > (power supply voltage - 3.5 V)
Signal type	
Maximum range	1.15 mm *[0.045"]*
Current consumption	20 mA max.
Frequency range	0 to 15 kHz
Instantaneous frequency deviation	10% with sensor mounted on Poclain Hydraulics motors
Operating temperature	- 40°C to + 125°C *[- 40°F to 257°F]*
Material	Brass housing
Protection rating	IP68 (sensitive side) / IP69K with mating conenctor (connector side)
Electrical protection	Protected against reverse polarity, short circuit to ground and supply
Mean Time To Failure (MTTF)	717 years with operating profile of 21% (8h per day, 229 days per year) Calculated according ISO13849-1 with component database SN29500
Mean Time To Dangerous Failure (MTTFd)	1 434 years

Layout



Installation

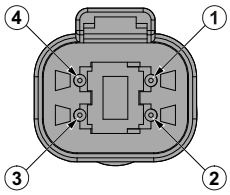
Disconnecting the accessories and speed set up

In the case of motors predisposed to speed, the existing shutter needs to be removed and eliminated before installing the sensor and its attachment device.

To install the sensor, see the "Installation guide" brochure No. B61352L.

Connection of the speed sensor

Deutsch connector : DT04-4P



Function	Pin number
+Vdc	1
Ground GND	2
Frequency output S1	3
Frequency output S2	4

For the connection of connectors, please refer to the connection table and the general cabling plan contained in the installation brochure for your transmission.

Electrical connections

Commercial name	KIT-CONNECT-4-PIN-DEUTSCH
Part number	A39961L

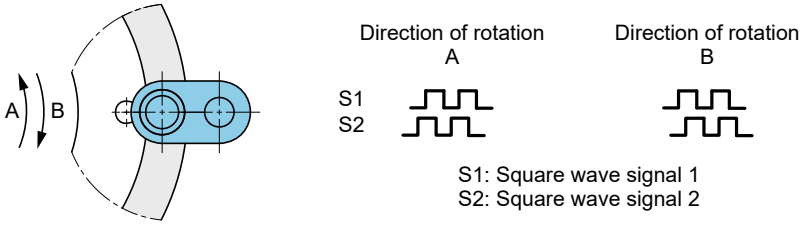
page 67

SPEED SENSOR TH

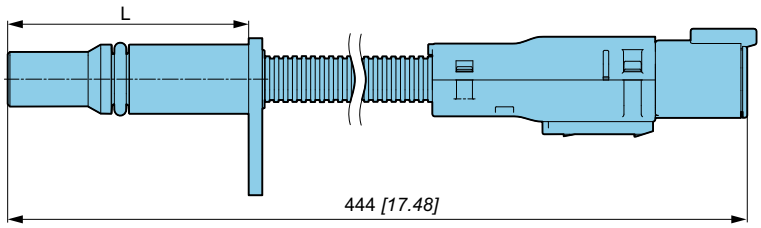
✔ **High resolution speed sensor**

Commercial name	**SPD-SENS-TH-12-44-P1-DTM4**	**SPD-SENS-TH-12-53-P1-DTM4**	**SPD-SENS-TH-12-62-P1-DTM4**
Part number	B43834U	B36959W	B36960X
Lenght **L**(*)	44 *[1.73]*	53 *[2.09]*	62 *[2.44]*
Hydraulic motor compatibility	MK04 (**)		
Function	Detect movements: High rotation speed and rotation direction		
Compatibility	Electronic transmission management		

(*) : According to the size of the motor, consult your Poclain Hydraulics sales engineer.
(**) : In case of request for other motors, please contact your Poclain Hydraulics application engineer in matter of feasibility.

Features	
Supply voltage	9 - 32 V
Current consumption	20 mmax. no load
Protection	Overvoltage (36 V DC), reverse voltage(36 V DC)
Output type	- 2 push-pull square wave signal - Max. load current: 20 mA per channel - Voltage at low state: < 0.9 V - Voltage at high state: > (power supply voltage - 3.5 V) - Output protected against short-circuits
Direction signal	The 2 output signals allow to determine the direction of the rotation.  S1: Square wave signal 1 S2: Square wave signal 2
Frequency range	0 to 30 kHz
Resolution range	Resolution depends of the magnetic target ring that is assembled in the motor. The resolution is specific for each motor. - MK04: 888 pulses / rev - MS02: 960 pulses / rev *** - MHP27: 1 824 pulses / rev *** (***) : Product in development. Consult your Poclain Hydraulics sales engineer.
Speed measuring accuracy	± 3% typ.
Operating temperature	- 40°C to + 105°C *[- 40°F to 221°F]*
Material	Stainless steel
Protection rating	IP6K9K
EC certificate	NF EN 14982: Agricultural and forestry machinery - Electromagnetic compatibility NF EN 13309: Construction machinery - Electromagnetic compatibility of machines with internal electrical power supply NF EN 12895: Industrial trucks - Electromagnetic compatibility
Mean Time To Failure (MTTF)	208 years with operating profile of 21% (8h per day, 229 days per year) Calculated according ISO13849-1 with component database UTE C 80-810
Mean Time To Dangerous Failure (MTTFd)	416 years

Layout

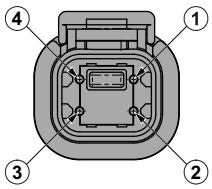


Installation

To install the sensor, see the "Installation guide" brochure No. B61352L.

Connection of the speed sensor

Deutsch connector: DTM04-4P



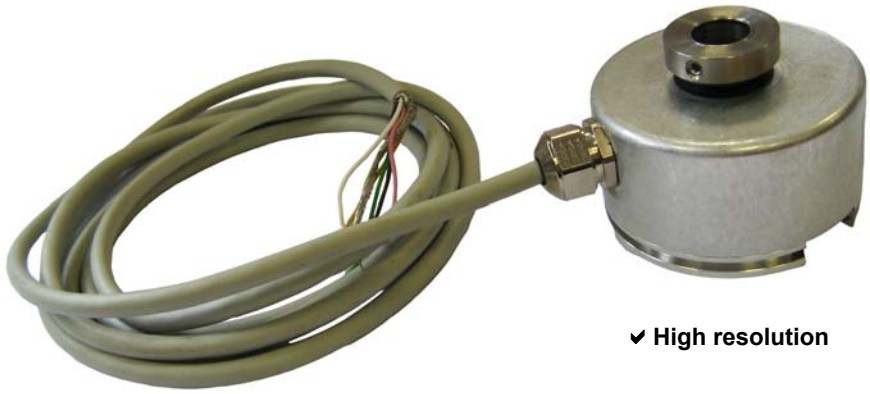
Function	Pin number
Ground	1
Output signal S2	2
+VBAT	3
Output signal S1	4

For the connection of connectors, please refer to the connection table and the general cabling plan contained in the installation brochure for your transmission.

Electrical connections

Commercial name	KIT-CONNECT-DTM-4S-NW8.5
Part number	B59113C

MAGNETIC INCREMENTAL HOLLOW SHAFT ENCODER



✔ **High resolution**

Commercial name	**ENCODER-HOLLOW-3600-12-2000**
Part number	A38403S
Hydraulic motors compatibility	MS18; MS35; MK35; MK47*
Function	Detect movements: rotation speed and rotation direction
Compatibility	Electronic transmission management

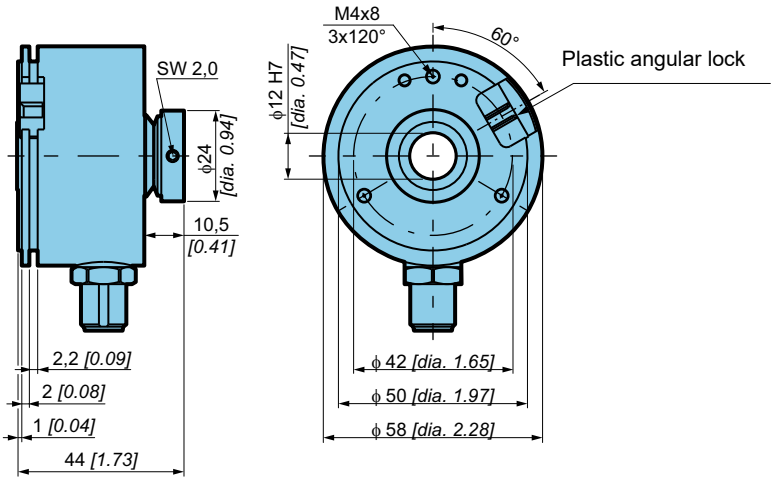
* In case of request for another motors, please contact your Poclain Hydraulics application engineer in matter of feasibility.

General Features	
Power supply voltage (+Vs)	10 - 30 VDC
Number of pulses per revolution	3600
Frequency dither	± 15%
Supply current (no load)	15 mA at 24 VDC
Output type	Push-pull
Max output current	30 mA per channel
Low level max	2,5 V
High level min	+Vs - 3,7 V
Switching frequency	320 kHz max
Electrical protection	Against short-circuits (0V and Vs) and polarity inversion

Mechanical Features	
Max revolutions	6000 rpm
Protection	IP65
Material	aluminium
Operating temperature	-20°C to +85°C *[-4°F to 185°F]*

Ambient conditions	
Vibration (sine)	IEC 60068-2-6 (<= 300 m/s^2 / 10 - 2000 Hz)
Vibration (random)	IEC 60068-2-64 (<= 0,1 g^2/Hz / 20 - 2000 Hz)
Shock	IEC 60068-2-27 (<= 1000 m/s^2 / 6 ms)
Bump	IEC 60068-2-29 (<= 1000 m/s^2 / 2 ms)
EMC immunity	EN 61000-6-2
EMC emission	EN 61000-6-3

Layout



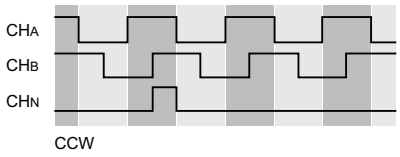
Connection of the encoder

The encoder has a cable with following parameters:

Lenght	2 m
Diameter	5,0 mm + 0,4 mm
Material	PUR, shielded cable with 5 wires
Wire section	0,14 mm^2

Function	Wire
Power supply (+Vs)	Brown
Square frequency signal A (CHA)	Green
Square frequency signal B (CHB)	Yellow
Ground (0V)	White
Start Top (CHN)	Pink
Connected to housing	Screen

Pulse diagram



Phase shift beetween CHA & CHB = 90°

Signal processing recommendation

The encoder is an incremental encoder providing a signal A, B and a start top.
These signals are generated by the encoder for each separate position 3600 times per revolution.
If your counting system monitors only one channel (Channel A, for example) disruption on the line or instability of position may cause generation of several high level signals on one channel only.
To ensure a correct count of the number of pulse and eliminate these spurious signals,it is important to take into account the two channels A and B to use the phase to eliminate spurious signals.
A large number of input card or tachometer provides this function by setting "AB 90 ° phase shift."

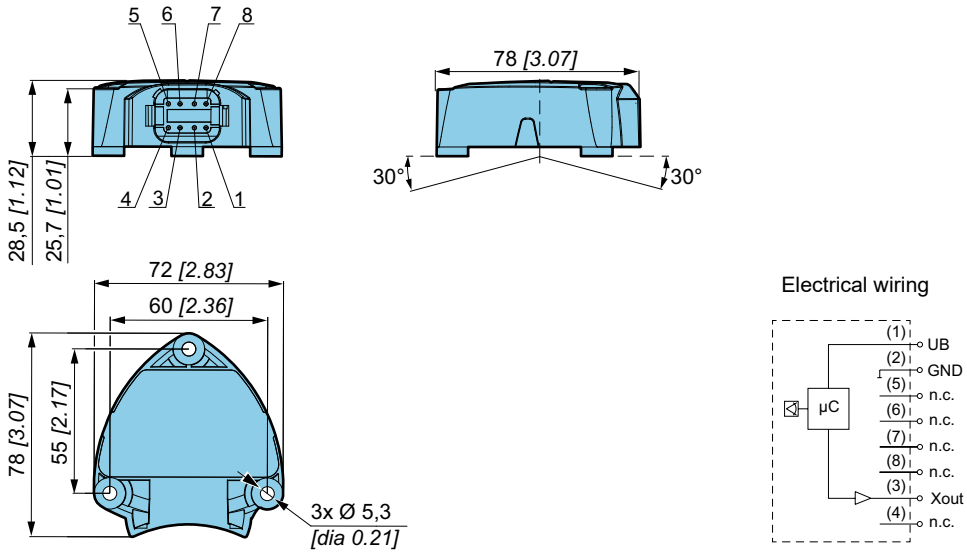
This feature also prevents any consideration of disturbance.
Such a disturbance could be seen as an encoder pulse if that channel is not correlated through channel B.

INCLINOMETER

Commercial name	POS-SENS-30-TILT-DT08
Part number	B32728X
Function	Measure the tilt angle

Features	
Supply voltage (Vs)	10V - 30V
Operating current	24 mA
Output signal	0,5V to 4,5V
Angular range	+/- 30°
Mass	100g
Linearity error	+/- 1%
Repeating accuracy	0,5°
Offset temperature drift	+/- 0,25% full scale
Operating temperature	- 40 °C to 70°C *[- 40 °F to 158 °F]*
Mechanical shock	20 000g max DIN IEC 68
Vibration test (sinusoidal)	DIN IEC 68 Part 2-6: 10...500...10Hz/10g/19h per axis
Random vibration	DIN IEC 68-2-64: 10-350Hz 16h per axis
Ingress protection	IP67
CE conformity	EMC Directive 2004/108/EC
Mean Time To Failure (MTTF)	140 years with operating profile of 21% (8h per day, 229 days per year) Calculated according the technical report IEC TR 62380
Mean Time To Dangerous Failure (MTTFd)	280 years
Electrical protection	
Overvoltage	36V/24h at +85°C
Polarity inversion	ISO 16750-2: 2010 (Vs and 0V)
Against short circuit	ISO 16750-2: 2010 (Vs and 0V)

Layout



Electrical connection

Commercial name	KIT-CONNECT-DT8-F
Part number	B47711J
	page 63

When wiring, check that the wire can neither be cut off, nor torn off when the machine is working or moving.

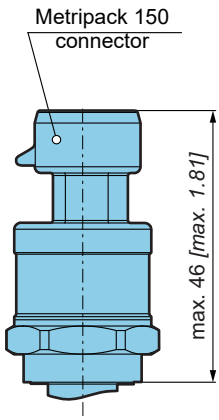
40 BAR PRESSURE SENSORS

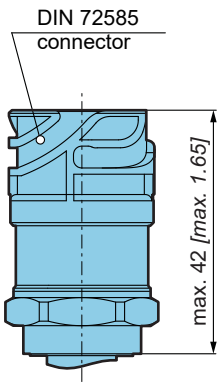


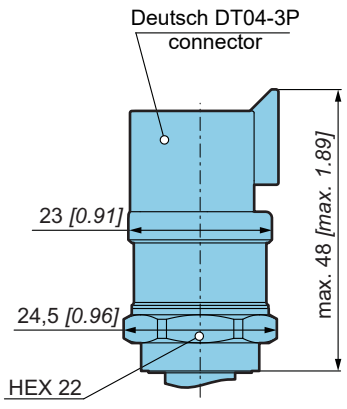
Commercial name	PRES-SENS-40B-G1/4-MP3	PRES-SENS-40B-G1/4-DIN	PRES-SENS-40B-G1/4-DT3
Part number	B58363M	B58368S	B57611U
Hydraulic connection	G1/4A	G1/4A	G1/4A
Electrical conneciton	Metripack 150 (3 pins)	DIN 72585 (3 pins, coding 1)	Deutsch DT04-3P
Ingress protection	IP67	IP6K9K	IP6K9K
Function	Measure the charge pressure		

Features	
Supply voltage (Ub)	5V DC ± 5%
Output signal	10% ... 90% (0.5V ... 4,5V at Ub=5V DC)
Output load	> 5k Ohm
Pressure range	40 bar *[580 PSI]*
Over pressure safety	250 bar *[3 626 PSI]*
Response time	calibrated 1ms
Accuracy	< 1%
Using temperature range	Ambient - 40 °C to 105 °C *[- 40 °F to 221 °F]*
	Storage - 40 °C to 100 °C *[- 40 °F to 212 °F]*
	Medium - 40 °C to 125 °C *[- 40 °F to 257 °F]*
Electrical protection	Overvoltage: +28,8V
	Polarity inversion: -5,2V
	Against short circuits (GND and Ub)
CE conformity	EN 61000-6-1/2/3/4
Shock resistance	500 g (DIN EN 60068-2-27)
Vibration resistance	25 g (IEC 60068-2-6 from 10 to 500Hz)
Mean Time To Failure (MTTF)	546 years with operating profile of 21% (8h per day, 229 days per year)
Mean Time To Dangerous Failure (MTTFd)	1 092 years

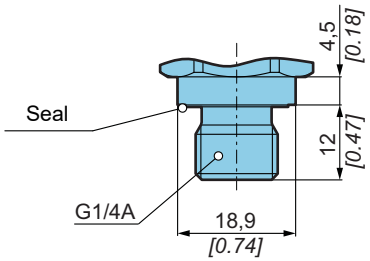
Layout







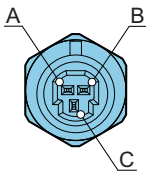
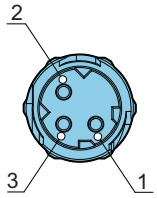
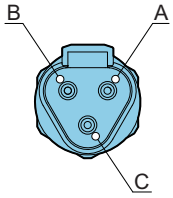
Sensor connection



Tightening torque

Connection	Seal	N.m *[lb.ft]*
G1/4A (ISO 1179-2)	HNBR	20 (+5Nm) *[14.75] (+3.69 lb.ft)*

Pinout

Metripack 150 (3 pins) connector	DIN 72585 (3 pins, coding 1) connector	Deutsch DT04-3P connector
		
A: GND B: +Ub C: Signal	1: +Ub 2: GND 3: Signal	A: +Ub B: Signal C: GND

Electrical connection	Commercial name	Part number	
Cable for pressure sensor connection	CABLE-PRESSURE-SENSOR-3M	003141105U	page 69
Connector kit for DIN72585 connector	KIT-CONNECT-4-PIN-DIN72585	B02394B	page 62
Connector kit for DT04-3P connector	KIT-CONNECT-3-PIN-DEUTSCH	B62766X	page 59

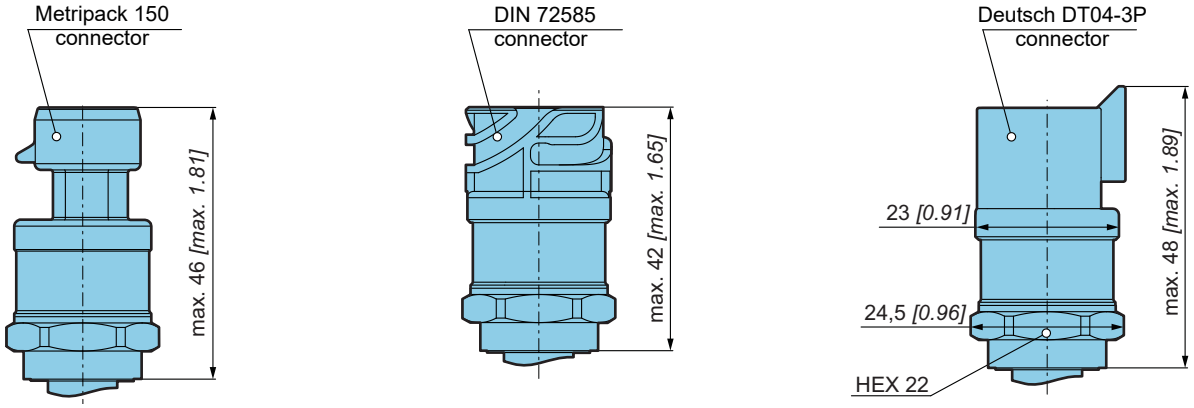
When wiring, check that the wire can neither be cut off, nor torn off when the machine is working or moving.

160 BAR PRESSURE SENSORS

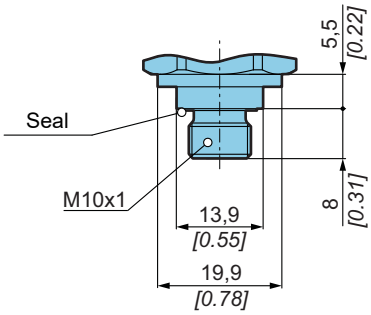
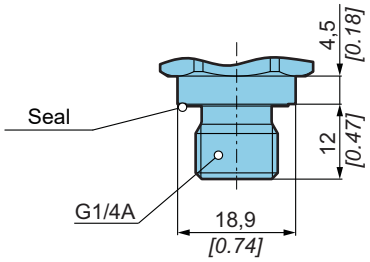
Commercial name	PRES-SENS-160B-M10-MP3	PRES-SENS-160B-M10-DIN	PRES-SENS-160B-M10-DT3	PRES-SENS-160B-G1/4-MP3	PRES-SENS-160B-G1/4-DIN
Part number	B58364N	B58369T	B57612V	B58365P	B58370U
Hydraulic connection	M10x1	M10x1	M10x1	G1/4A	G1/4A
Electrical conneciton	Metripack 150 (3 pins)	DIN 72585 (3 pins, coding 1)	Deutsch DT04-3P	Metripack 150 (3 pins)	DIN 72585 (3 pins, coding 1)
Ingress protection	IP67	IP6K9K	IP6K9K	IP67	IP6K9K
Function	Measure the pressure on the brake system				

Features	
Supply voltage (Ub)	5V DC ± 5%
Output signal	10% ... 90% (0.5V ... 4,5V at Ub=5V DC)
Output load	> 5k Ohm
Pressure range	160 bar *[2 320 PSI]*
Over pressure safety	320 bar *[4 640 PSI]*
Response time	calibrated 1ms
Accuracy	< 1%
Using temperature range	Ambient - 40 °C to 105 °C *[- 40 °F to 221 °F]*
	Storage - 40 °C to 100 °C *[- 40 °F to 212 °F]*
	Medium - 40 °C to 125 °C *[- 40 °F to 257 °F]*
Electrical protection	Overvoltage: +28,8V
	Polarity inversion: -5,2V
	Against short circuits (GND and Ub)
CE conformity	EN 61000-6-1/2/3/4
Shock resistance	500 g (DIN EN 60068-2-27)
Vibration resistance	25 g (IEC 60068-2-6, from 10 to 500Hz)
Mean Time To Failure (MTTF)	546 years with operating profile of 21% (8h per day, 229 days per year)
Mean Time To Dangerous Failure (MTTFd)	1 092 years

Layout



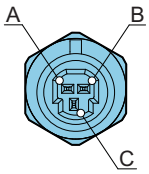
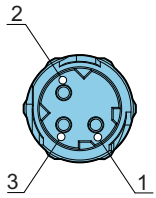
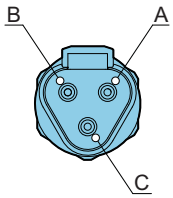
Sensor connection

M10x1 (ISO 9974-2)	G1/4A (ISO 1179-2)
	

Tightening torque

Connection	Seal	N.m *[lb.ft]*
M10x1 (ISO 9974-1)	HNBR	20 (+2Nm) *[14.75] (+1.47 lb.ft)*
G1/4A (ISO 1179-2)		20 (+5Nm) *[14.75] (+3.69 lb.ft)*

Pinout

Metripack 150 (3 pins) connector	DIN 72585 (3 pins, coding 1) connector	Deutsch DT04-3P connector
		
A: GND B: +Ub C: Signal	1: +Ub 2: GND 3: Signal	A: +Ub B: Signal C: GND

Electrical connection	Commercial name	Part number	
Cable for pressure sensor connection	CABLE-PRESSURE-SENSOR-3M	003141105U	page 69
Connector kit for DIN 72585 connector	KIT-CONNECT-4-PIN-DIN72585	B02394B	page 62
Connector kit for DT04-3P connector	KIT-CONNECT-3-PIN-DEUTSCH	B62766X	page 59

When wiring, check that the wire can neither be cut off, nor torn off when the machine is working or moving.

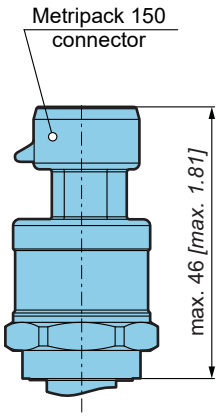
600 BAR PRESSURE SENSORS

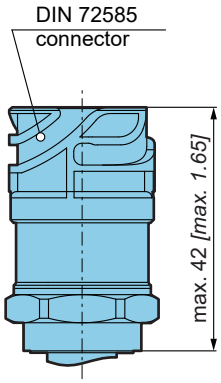


Commercial name	PRES-SENS-600B-9/16-MP3	PRES-SENS-600B-G1/4-MP3	PRES-SENS-600B-G1/4-DIN
Part number	B58366Q	B58367R	B58371V
Hydraulic connection	9/16-18 UNF-2A	G1/4A	G1/4A
Electrical conneciton	Metripack 150 (3 pins)	Metripack 150 (3 pins)	DIN 72585 (3 pins, coding 1)
Ingress protection	IP67	IP67	IP6K9K
Function	Measure the pressure on the high pressure system		

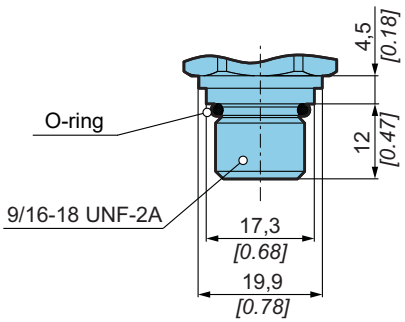
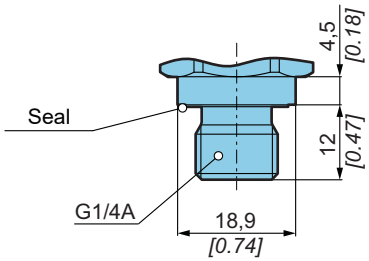
Features	
Supply voltage (Ub)	5V DC ± 5%
Output signal	10% ... 90% (0.5V ... 4,5V at Ub=5V DC)
Output load	> 5k Ohm
Pressure range	600 bar *[8 702 PSI]*
Over pressure safety	1200 bar *[17 404 PSI]*
Response time	calibrated 1ms
Accuracy	< 1%
Using temperature range	Ambient - 40 °C to 105 °C *[- 40 °F to 221 °F]*
	Storage - 40 °C to 100 °C *[- 40 °F to 212 °F]*
	Medium - 40 °C to 125 °C *[- 40 °F to 257 °F]*
Electrical protection	Overvoltage: +28,8V
	Polarity inversion: -5,2V
	Against short circuits (GND and Ub)
CE conformity	EN 61000-6-1/2/3/4
Shock resistance	500 g (DIN EN 60068-2-27)
Vibration resistance	25 g (IEC 60068-2-6, from 10 to 500Hz)
Mean Time To Failure (MTTF)	546 years with operating profile of 21% (8h per day, 229 days per year)
Mean Time To Dangerous Failure (MTTFd)	1 092 years

Layout





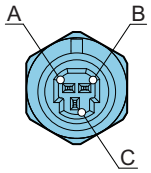
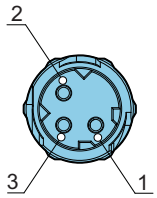
Sensor connection

9/16-18 UNF-2A (ISO 11 926)	G1/4A (ISO 1179-2)
	

Tightening torque

Connection	Seal / O-ring	N.m *[lb.ft]*
9/16-18 UNF-2A (ISO 11 926) G1/4A (ISO 1179-2)	HNBR	20 (+5Nm) *[14.75] (+3.69 lb.ft)*

Pinout

Metripack 150 (3 pins) connector	DIN 72585 (3 pins, coding 1) connector
	
A: GND B: +Ub C: Signal	1: +Ub 2: GND 3: Signal

Electrical connection	Commercial name	Part number	
Cable for Metripack connector	CABLE-PRESSURE-SENSOR-3M	003141105U	page 69
Connector kit for DIN72585 connector	KIT-CONNECT-4-PIN-DIN72585	B02394B	page 62

When wiring, check that the wire can neither be cut off, nor torn off when the machine is working or moving.

DIGITAL SENSORS

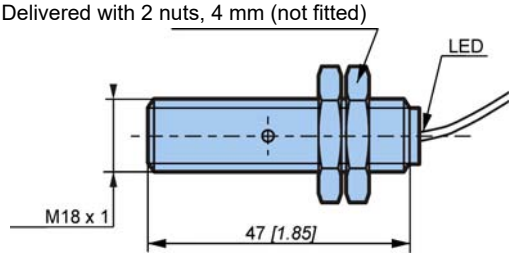
Commercial name	DETECTEUR TOR M18 CABLE	DETECTEUR TOR M18 CONNECT
Part number	003241160A	003241159Z
Function	Detects movement	
Compatibility	Electronic transmission management	

Features	
Supply voltage (Vs)	10 to 30 V
Nominal range	8 mm *[0.31]*
Guaranteed detection distance	until6.48 mm *[0.25]*
Maximum switching frequency	500 Hz
Supply current	0 to 200 mA
Offload consumption	15 mA
Maximum charging current	200 mA
Max. voltage drop	3 V
Voltage drop (charge 20 mA)	< to 1.5 V
Operating temperature	-25°c to 70°c *[-13 °F to 158 °F]*
Housing material	Brass
Ingress protection	IP67
Electrical protection	Against short-circuits (0V and Vs) Against polarity inversion

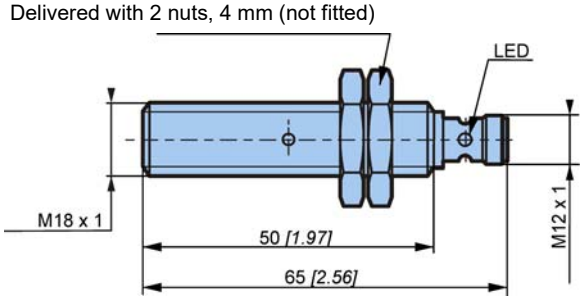
Layout	Sensor with cable	Sensor with connector

L = 2m (3 wires x 0.34mm²)

Delivered with 2 nuts, 4 mm (not fitted)



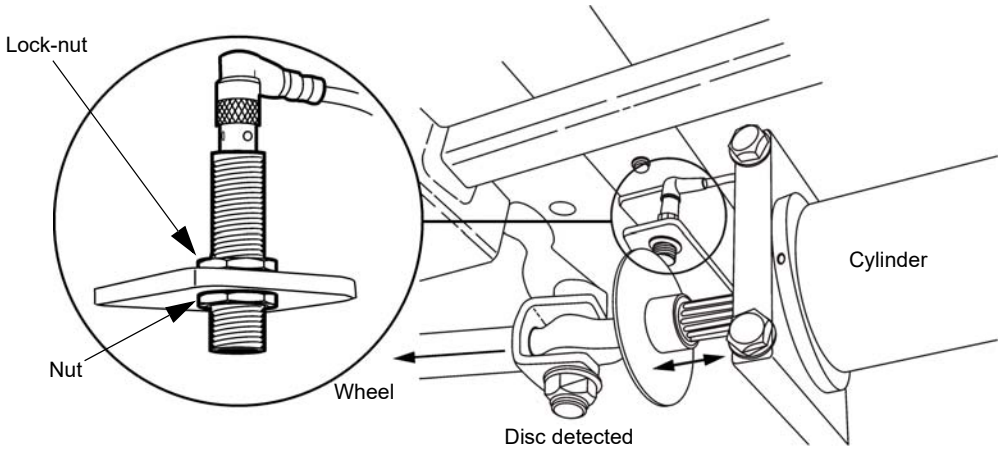
Delivered with 2 nuts, 4 mm (not fitted)



Installation of the digital steering sensor

The steering sensor must be secured (with the 2 screws supplied) on a rigid sheet at least 2 mm thick.

Example of mounting

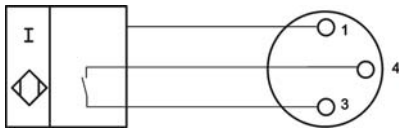


N.m *[lb.ft]* ± 10 %
30 *[22.1]*

The steering sensor must be secured (with the 2 screws supplied) on a rigid sheet at least 2 mm thick.

Example of mounting

Pin	Color	Description
1	Brown	Supply
4	Black	Signal
3	Blue	Ground



Electrical connection	90°	180°
Commercial name	ELEC-CABLE-M12-90°-5000	ELEC-CABLE-M12-180°-5000
Part No.	A04999J	A07468S
	page 70	page 70

When wiring, check that the wire can neither be cut off, nor torn off when the machine is working or moving.

In case of using an M12 90° cable (A04999J), pay attention to the alignment of the elbow with the sensor´s bracket to avoid twisting the sensor´s connector pins.

The M12 nut must be tightened with a tightening torque from 0.6 Nm (hand-tight) to 1.5 Nm (using a torque wrench). An excessive tightening can damage the M12 connector.

ANALOG TEMPERATURE SENSORS



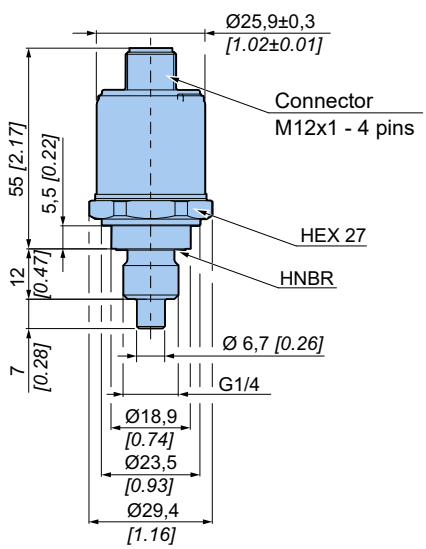
Commercial name	TEMP-SENS-G1/4-M12-7	TEMP-SENSOR-G1/4-DIN-7	TEMP-SENSOR-G1/4-DIN-52
Part number	B45088H	B31477N	B00091X
Compatibility	Electronic transmission management		
Features			
Supply voltage (Vs)	5V ± 0.5V		
Output signal	*0.5V to 4.5V* ratiometric Saturation at 0.4V for temperatures <-23°C *[-9.4F]*		
Response time	4 s for 50°C *[122°F]* step 8 s for 90°C *[194°F]* step		
Accuracy	≤ ± 3% FS		
Permissible pressure	600 bar *[8702 PSI]*		
Measuring range	-20 to +120°C *[-4 to +248°]*		
Using temperature range	Medium - 40 °C to 120 °C *[- 40 °F to 248 °F]*		
	Ambient - 40 °C to 100 °C *[- 40 °F to 212 °F]*		
	Storage - 40 °C to 100 °C *[- 40 °F to 212 °F]*		
Housing material	Stainless steel 1,4571		
Electrical connection	M12 - 4 pins	DIN 72585 - 4 pins coding 1	
Ingress protection	IP67	IP6K9K	
Electrical protection	Overvoltage: 14V		
	Reverse polarity		
	Against short circuits (0V and Vs)		
Mean Time To Failure (MTTF)	682 years with operating profile of 21% (8h per day, 229 days per year)		
Mean Time To Dangerous Failure (MTTFd)	1 364 years		

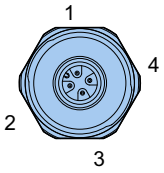
Mounting

To obtain a good temperature reading put the sensitive part of the sensor in the heart of the fluid stream.

Layout

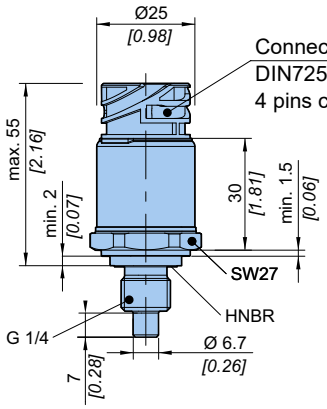
TEMP-SENS-G1/4-M12-7

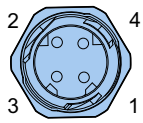




1: Not used
2: +UB
3: Output signal 0.5V to 4.5V
4: Ground

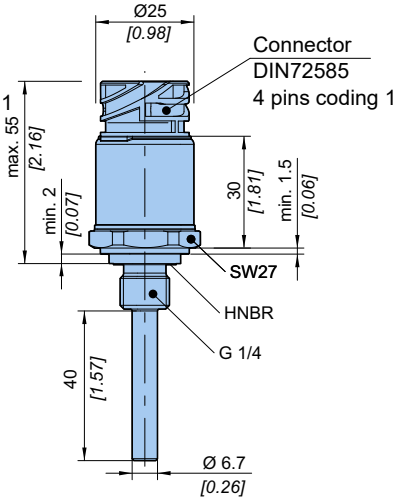
TEMP-SENSOR-G1/4-DIN-7





1: +5VDC
2: Ground
3: Output signal 0.5V to 4.5V
4: Not used

TEMP-SENSOR-G1/4-DIN-52



Hydraulic connection

Connection	Seal	N.m *[lb.ft]* ± 10 %
G 1/4"	HNBR	20 *[14.8]*

Electrical connection DIN

Commercial name	KIT-CONNECT-4PIN-DIN72585
Part number	B02394B
	page 71

Electrical connection M12	90°	180°
Commercial name	ELEC-CABLE-M12-90°-5000	ELEC-CABLE-M12-180°-5000
Part number	A04999J	A07468S
	page 70	page 70

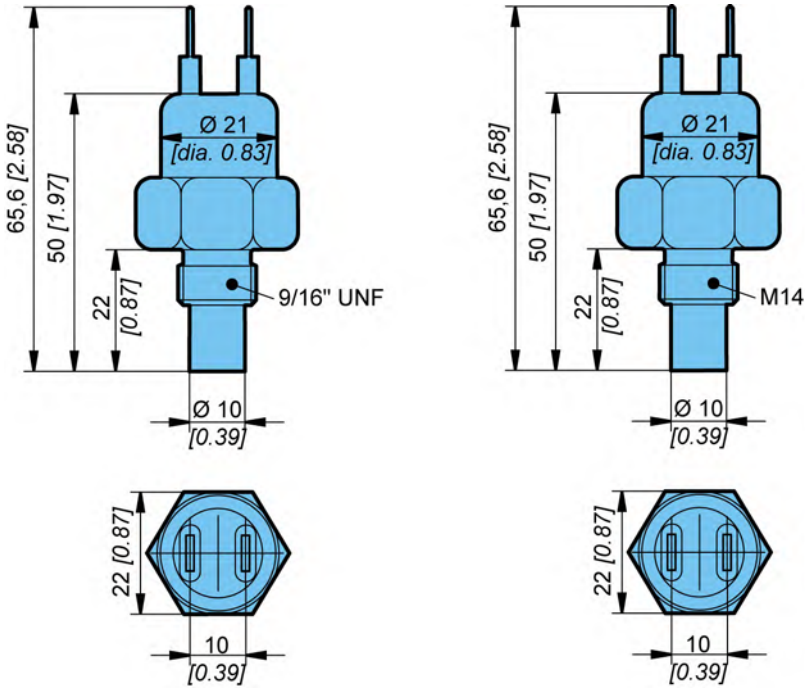
When wiring, check that the wire can neither be cut off, nor torn off when the machine is working or moving.

THERMOCONTACT

Commercial name	TEMP-SENSOR-M14-90C-NC	TEMP-SENSOR-9/16-90C-NC
Part number	B37087L	B37088M
Compatibility	Electronic transmission management	
Fonction	Measure the temperature of the hydraulic circuit	

Features	
Threshold of temperature	90°C ± 3°C *[194°F± 37.4°F]*
Hysteresis	< 20°C *[<68°F]*
Type of contact	switch opens with increasing temperature
Max. voltage	30 Volt
Max. current	Ohmic load 16A and inductive load 10A
Using temperature range	-40 to +130°C *[-40 to +266°F]*
Max. pressure	100 bar *[1 450 PSI]*
Ingress protection	IP67
Housing material	CuZn38Pb2

Layout	9/16”UNF	M14



Hydraulic connection

Connection	O’ring	N.m *[lb.ft]* ± 10 %
M14 x 1,5	-	20 *[14.7]*
9/16” UNF	-	

Electrical connection

Terminal blades 6,3 x 0,8 *[0.25 x 0.03]*

When wiring, check that the wire can neither be cut off, nor torn off when the machine is working or moving.

JOYSTICK WITH CENTER LOCK

Commercial name	JOYSTICK-35°-HANDLE-LOCK
Part number	003442799X
Compatibility	Electronic transmission management
Function	Joystick with medium lock. Provide the translation speed setting.

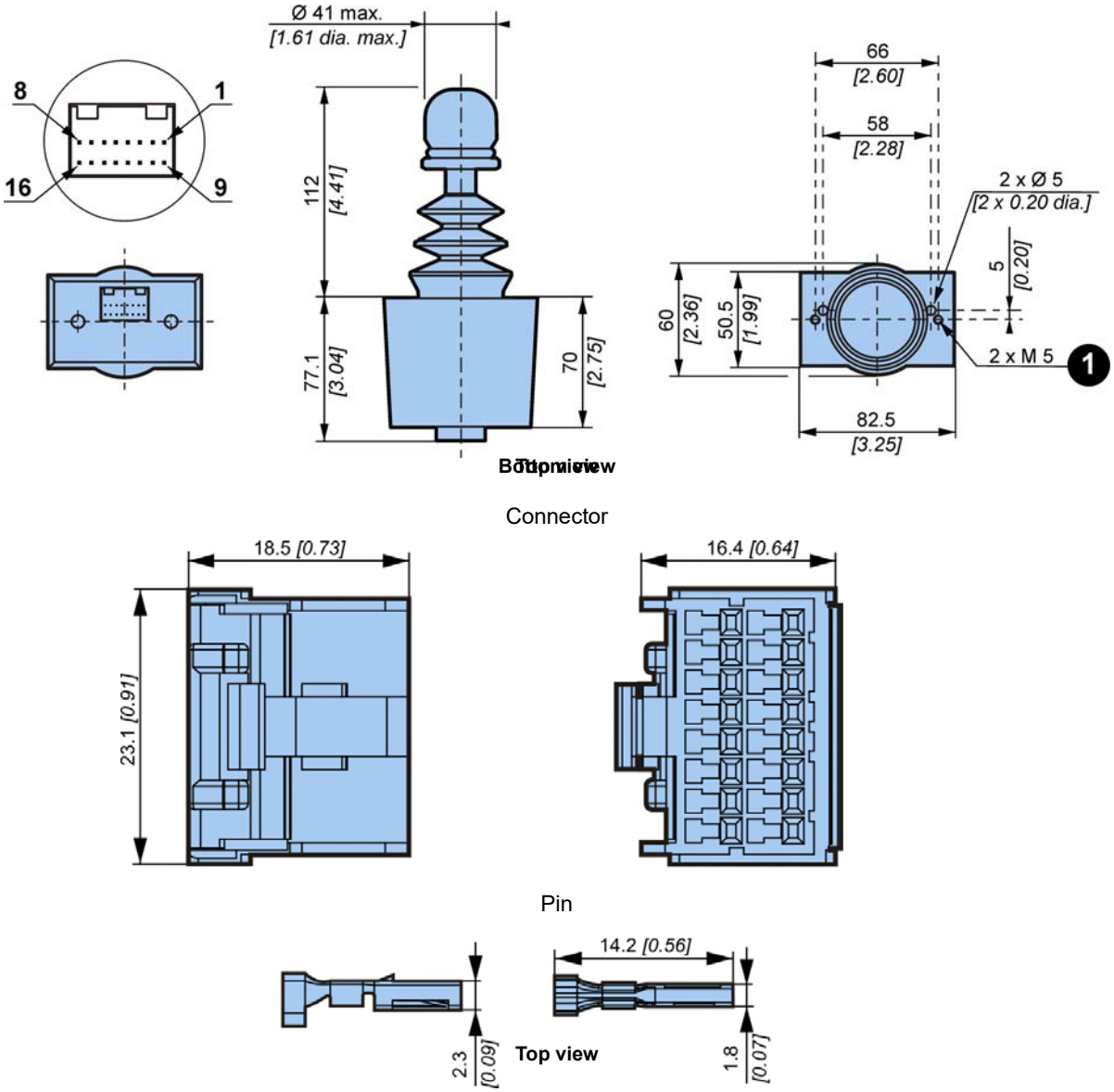
Joystick is provided with 16 pin AMP Multilock connector (see the picture above).

Joystick features	
Supply voltage (Vs)	5 V
Output signal	10% to 90% of supply voltage
Resistance	2k Ohm Tolerance ±20%
Expected service life	500 000 cycles
Electrical stroke	± 32°
Mechanical stroke	± 35°
Maximum applied force	300 N full deflection, 130 mm from flange
Operating force	17.8 N full deflection, 55 mm from flange
Breakout force	6.2 N, 55 mm from flange
Directional switches communication angle	5° ± 1° either side of center
Direction switches max. load current	200 mA resistive
Operating temperature range	- 25 °C to + 70 °C *[- 13 °F to 158 °F]*
Mass	560 g *[1.23 lb]* with HKN handle fitted
Ingress protection	IP65

Connector features		
Manufacturer		AMP
Components	Connector	174046-2
	16 pins	175062-1
Wire range	0.3 to 0.56 mm^2	
Wire insulation diameter	1.8 to 2 mm	

Mounting tools	Reference AMP
Chuck-jaw + crimpers	58522-1

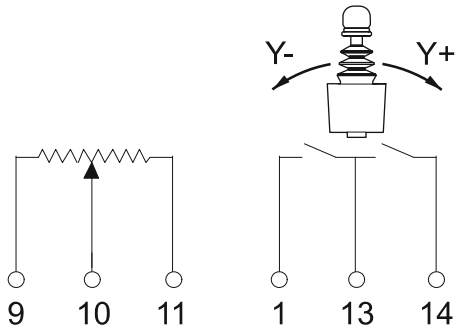
Layout



Installation

Electrical wiring

Terminal	Description
1	Directional switches Y-
9	Ground
10	Output voltage signal
11	Supply
13	Common directional switches
14	Directional switches Y+



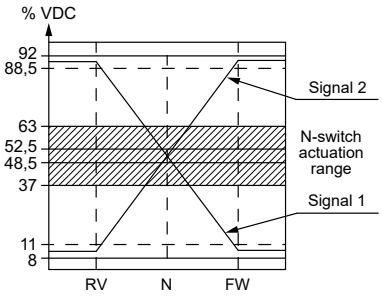
When wiring, check that the wire can neither be cut off, nor torn off when the machine is working or moving.

JOYSTICK WITH Z GATE

Commercial name	JOYSTICK-30°-Z-GATE-M10
Part number	A37706K
Compatibility	Electronic transmission management
Function	Joystick with Z gate provide the ground drive speed command.
Type	Hall Effect Joystick with two opposite analog signals and a neutral switch.

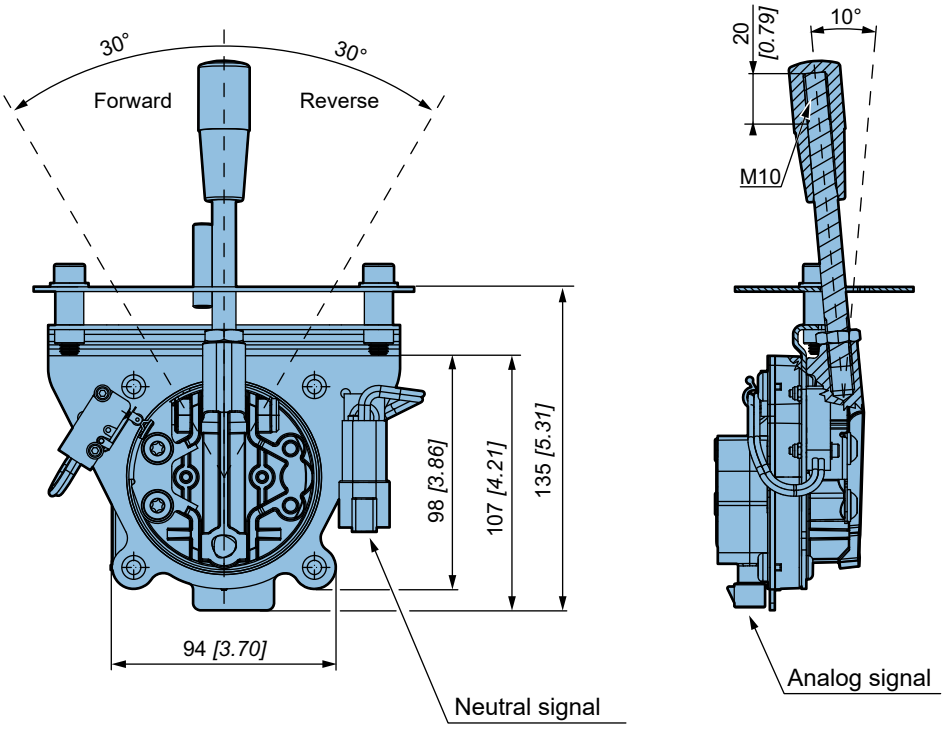
Features

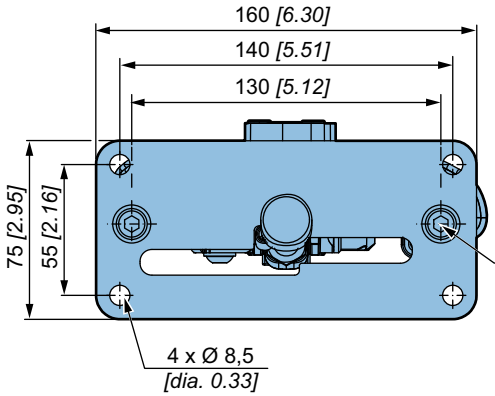
Supply voltage of analog sensor (VDC)	5 V ± 0,5 V
Electrical protection of analog sensor	Over voltage: 14.4 V Reverse polarity Against short-circuits (0V and VDC)
Output signal of analog sensor	8% to 92% of VDC
Max. hysteresis of analog signal	±1% of VDC
Max. load current of analog sensor	10 mA per channel
Mini. load resistance of analog sensor	30 kΩ
Contact type of the neutral switch	NO and NC
Neutral switch operating threshold in forward	52,5% < S2 < 63% of VDC 37% < S1 < 48,5% of VDC
Neutral switch operating threshold in reverse	37% < S2 < 48,5% of VDC 52,5% < S1 < 63% of VDC
Mini. load current of neutral switch	5 mA under 6 V; 2 mA under 12 V; 1 mA under 24 V
Max. load current of neutral switch	3 A



Operating angle	± 30°
Operating force	From 1,2 to 2,3 Nm
Operating temperature range	-40 °C to +80 °C *[-40°F to +176 °F]*
Degrees of protection	IP67
Life time	500,000 cycles
Mass	1 kg *[2.20 lb]*

Layout



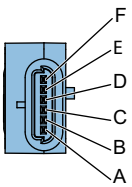


According to the application, the mounting of another handle must be validated to avoid that its weight, its height and the vibrations induce unexpected movement of the joystick.

Do not remove the Z grid during joystick mounting because there would be a risk of escape of roller on switch bracket and breakage of neutral switch actuator.

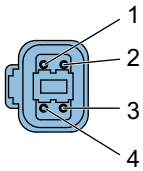
Electrical wiring

Analog signal



A	Signal 1
B	Ground signal 1
C	+5V signal 1
D	+5V signal 2
E	Signal 2
F	Ground signal 2

Neutral signal



1	Common
2	Opened contact in neutral position
3	Closed contact in neutral position
4	Not used

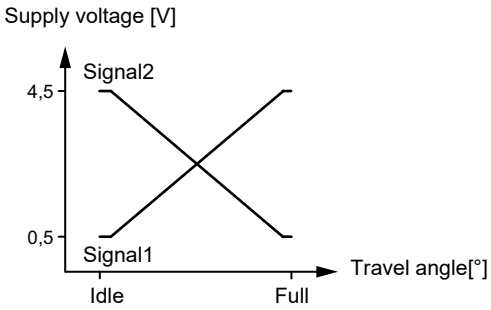
For SmartDrive™ controllers use the analog signal 2 and opened contact in neutral position.

Mating connector kit

Commercial name	Part Number	
KIT-CONNECT-4-PIN-DEUTSCH	A39961L	page 61
KIT-CONNECT-6-PIN-MP	A38140G	page 53

ELECTRONIC TRAVEL PEDAL

Commercial name	ELEC-HORIZ-PEDAL-30°-DUAL
Part number	A50838J
Function	Pedal with dual output signal. Contactless sensor. Travel and brake control.
Compatibility	Electronic transmission management.

Features	
Supply voltage (Vs)	5 V ± 0,5 V
Output signal	signal 1: 10% to 90% of the supply voltage signal 2: 90% to 10% of the supply voltage 5 V supply voltage example: 
Electronic protections	• against short circuits (0V and Vs) • overvoltage to 24 V • polarity inversion to -15 V
Operating temperature	- 40 °C to + 85 °C *[- 40 °F to 185 °F]*
Weight	0,96 kg *[2.11 lb]*
Ingress protection	IP66
Mean Time To Failure (MTTF)	26 years with operating profile of 21% (8h per day, 229 days per year) Calculated according the reliability prediction method NPRD-95.
Mean Time To Dangerous Failure (MTTFd)	52 years

Electrical connection

Pedal is delivered with a connection kit:

Counter connector kit includes:	• Connector	AMP ref. 1-967616-1 (x1)
	• Terminals	AMP ref. 0-962885-5 (x7)
	• Wire seal	AMP ref. 0-0967067-1 (x7)
	• Cavity plug	AMP ref. 967056-1 (x4)

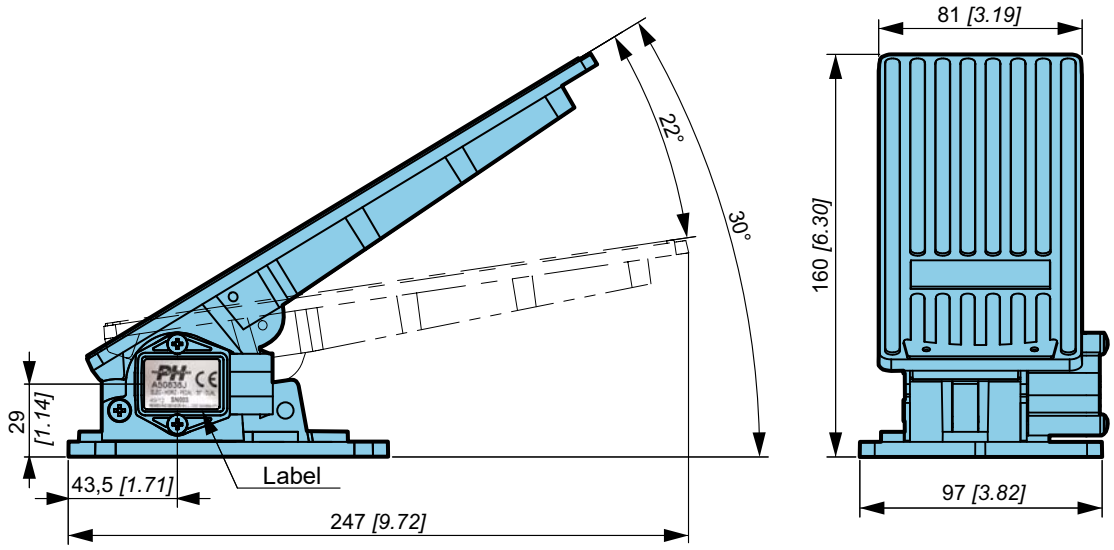
To crimp correctly use:

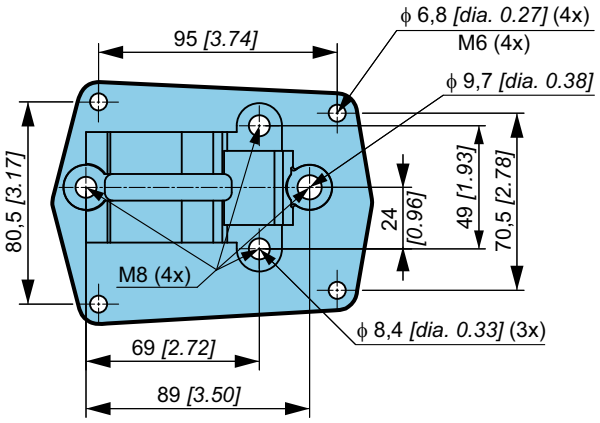
- Special crimping tool Tyco: 0-0539 635-1
- Wire gauge: AWG20
- External diameter of the wire: between1,29 mm and 1,6 mm

It is possible to connect a harness to use only 1 signal with connector Weather Pack: A51444S (for more details, see page 73).

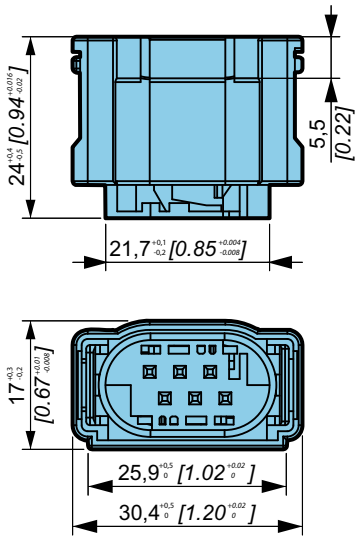
It is possible to connect a harness to use 2 signals with connector Deutsch: A51445T (for more details, see page 74).

Layout





Tyco connector



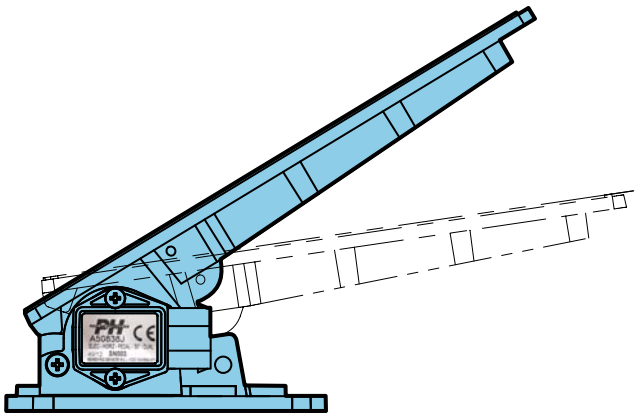
Installation

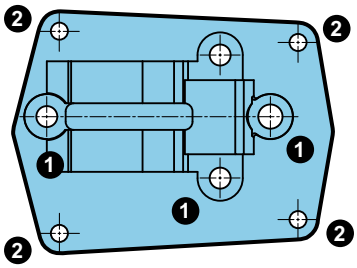
Fixing on support:

Sheet thickness must be a minimum of 4 mm *[0.16 inch]*.

The pedal may be fixed on its support in two ways; preferably with 4x M6 screws, or by 3 x M8 screws (not supplied).

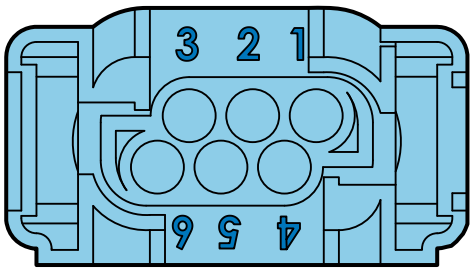
Ref.		Quantity	Class	N.m *[lb.ft]* ± 10 % (as per standard DIN 912)
1	M8	3	8.8	25 *[18.44]*
2	M6	4	8.8	10 *[7.37]*





If you need to fix pedal with 4xM8 screws, take care to use one shortened head screw (according DIN 7984) due to the interference with connector counter-part.

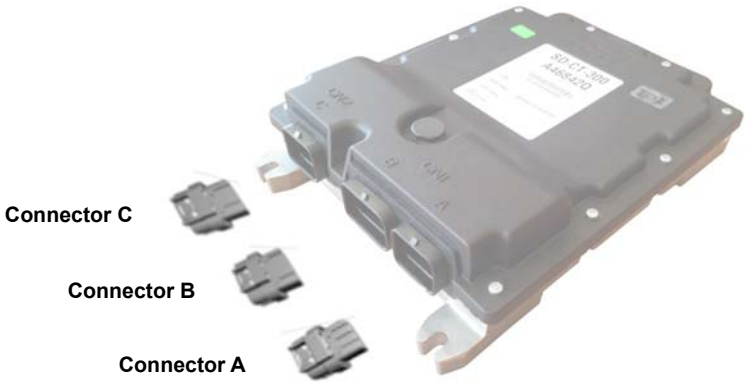
Electrical wiring



Assignment	Function
1	5V (signal 1)
2	0V (signal 1)
3	signal 2
4	signal 1
5	0V (signal 2)
6	5V (signal 2)

When wiring, check that the wire can neither be cut off, nor torn off when the machine is working or moving.

SMARTDRIVE™ CT MAIN CONNECTOR



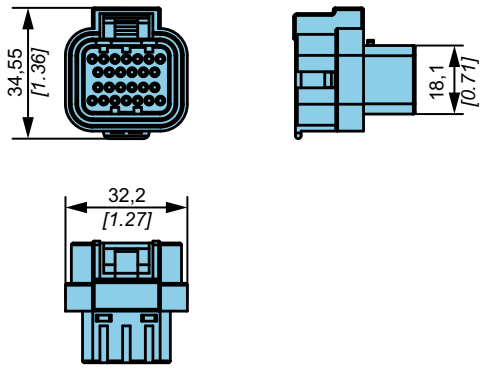
Characteristics			SD-CT-200	SD-T-300
Commercial name			KIT-CONNECT-SD-CT-200	KIT-CONNECT-SD-CT-300
Poclain Hydraulics part number			A48149L	A48140B
Function	SmartDrive™ CT controller's Counter-part connectors			
Compatibility	Electronic transmission management with SmartDrive™ CT controller			
Component		**AMP reference**		
Connector A		1473416-1	x1	x1
Connector B		4-1437290-1	x1	x1
Connector C		3-1437290-7	0	x1
Sockets		3-1447221-3	x65	x90
Stoppers		4-1437284-3	x50	x75
Wire section			0,75 to 1,25 mm² *[0.00116 to 0.00194 in²]*	
Insulation diameter			for wire section 0,75 to 1,25 mm² *[0.00116 to 0.00194 in²]* : 1,6 to 2,4 mm *[0.063 to 0.094 in]*	
Operating temperature			-40°C to 85°C *[-40°F to 185°F]*	
Ingress Protection			IP67	

Mounting tools for the connector

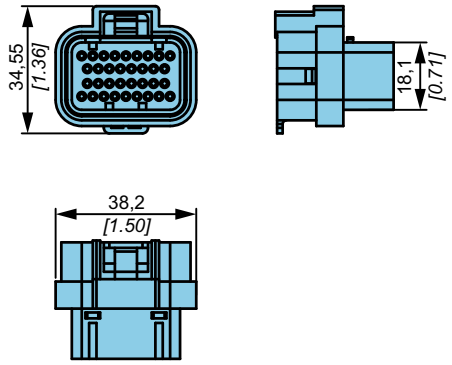
Description		AMP reference
Crimpers		1454509-1

Overall dimensions

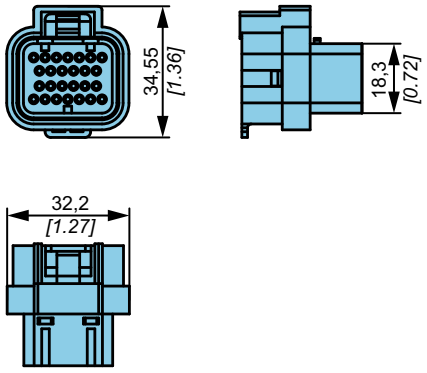
Connector A: 1473416-1



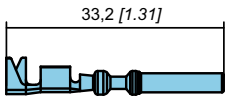
Connector B: 4-1437290-1



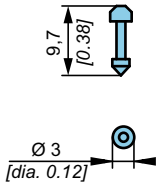
Connector C: 3-1437290-7



Socket:3-1447221-3



Stopper: 4-1437284-3



SMARTDRIVE™ CT COMMUNICATION CONNECTOR

This connector has to be present on the machine to permit SmartDrive™ CT maintenance.

Commercial name	KIT-CONNECT-COM-M-SD-CT
Part number Poclain Hydraulics	A48693C
Function	Diagnosis and download the software embedded in the SmartDrive ™ CT controller via CAN bus
Compatibility	Electronic transmission management with SmartDrive™ CT controller
Manufacturer	DEUTSCH

Features			DEUTSCH reference
Components		1x Receptacle	HD10-9-1939PE
		1x Closing cap	HDC9-JDL082397
		1x Gasket	HD10-9-GKT
		7x Pin	0460-202-1631 (AWG16-20)
		4x Stopper	114-017
Operating temperature	For the connector: -55°C to 125°C *[-67°F to 257°F]*		
	For the gasket: -57°C to 107°C *[-70.6°F to 224.6°F]*		
Ingress Protection	IP67		
Wire section	0,5 to 1.0 mm^2 *[0.019 to 0.039 in^2]* (16, 18, 20 AWG)		
Insulation diameter	1,35 to 3,05 mm *[0.053 to 0.12 in]*		

Mounting tools for the connector

Description		AMP reference
Crimpers		HDT-48-00
Extractor		0411-310-1605

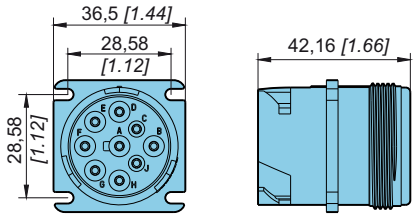
Connector mounting

Strip the wires to a length of 5 mm *[0.19 in]*.
Crimp the wires onto the pins as shown in the table below.

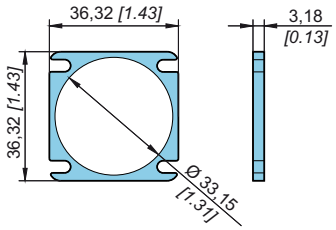
N° pin connector on SmartDrive™ CT controller		Function	N° pin male communication connector
		Ground	A
		VBAT_P	B
CAN 2 vehicle	Connector B pin 10	CAN2 H	C
	Connector B pin 18	CAN2 L	D
-	-	-	E
-	-	-	F
-	-	-	G
CAN 1 diagnosis	Connector B pin 1	CAN 1 H	H
	Connector B pin 2	CAN 1 L	J

Overall dimensions

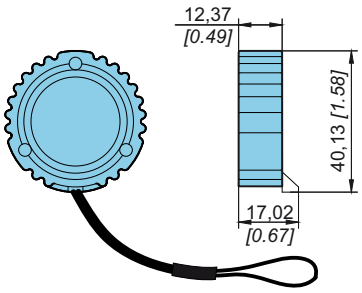
Receptacle: HD10-9-1939PE



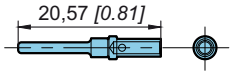
Gasket: HD10-9-GKT



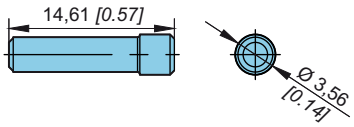
Cap: HDC9-JDL082397



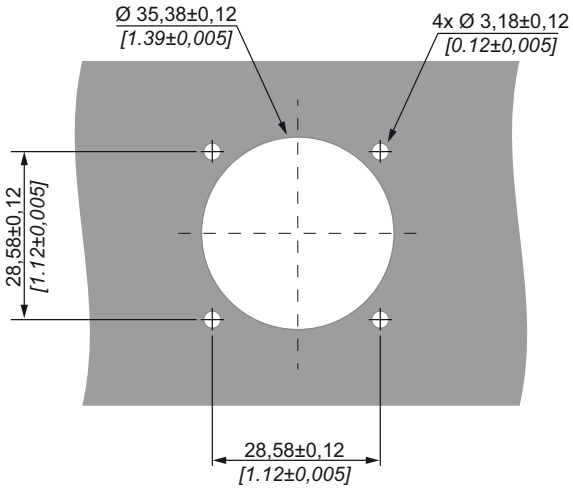
Pin: 0460-202-1631



Stopper: 114017



Panel cutout



Maximum panel thickness: 6,35 mm *[0.25 in]*

CONNECTOR KIT 120Ω

Commercial name	KIT-PLUG-120-DTM-2S
Part number	A52539H
Function	120Ω termination resistor for CAN bus
Compatibility	Electronic transmission management with SmartDrive™ CT-30
Manufacturer	DEUTSCH

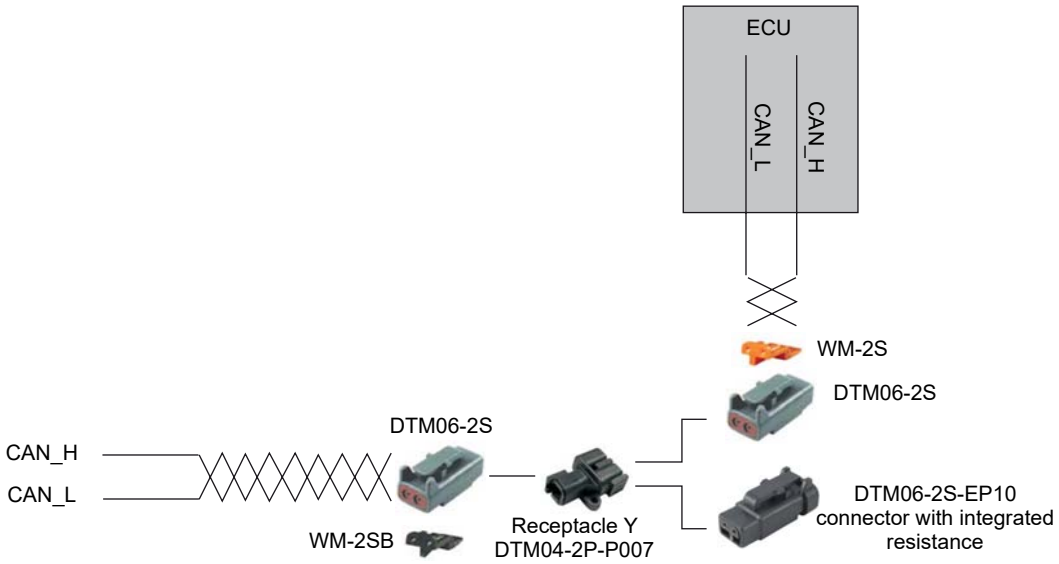
Features			DEUTSCH reference
Components		1x Receptacle	DTM04-2P-P007
		2x Connector	DMT06-2S
		1x Wedgelock	WM-2S
		1x Wedgelock	WM-2SB
		1x Connector with integrated resistance	DMT06-2S-EP10
		7x Sockets	0462-201-2031
Operating temperature		-55°C to 125°C *[-67°F to 257°F]*	
Wire section		0,2 to 0,5 mm^2 *[0.008 to 0.019 in²]*	
Insulation diameter		1,35 to 3,05 mm *[0.053 to 0.12 in]*	
Pin material		Gold plated	
Contact size		20	

Mounting tools for the connector

Description		AMP reference
Crimpers		HDT-48-00

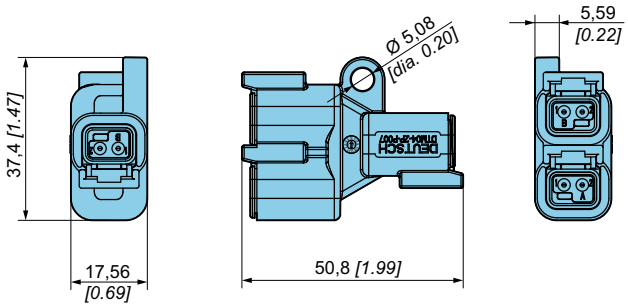
Connector mounting

Strip the wires to a length of 5 mm *[0.19 in]*.
Crimp the wires onto the sockets as shown in the diagram below.

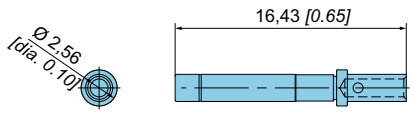


Dimensions

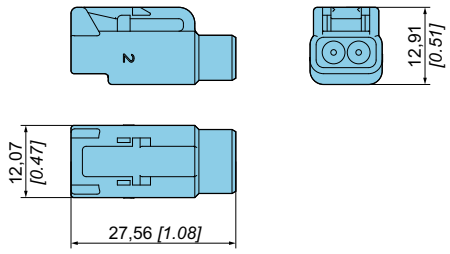
Receptacle Y: DTM04-2P-P007



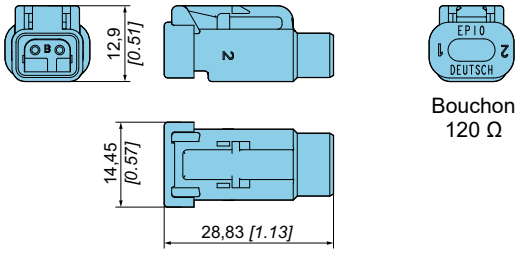
Socket: 0462-201-2031



Connector: DTM06-2S

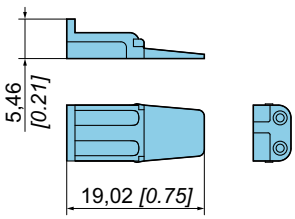


Connector with integrated resistance: DTM06-2S-EP10

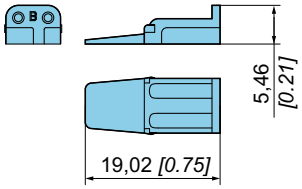


Bouchon
120 Ω

Orange wedgelock: WM-2S



Black wedgelock: WM-2SB



3-PIN WEATHER PACK CONNECTOR

Commercial name	KIT CONNECTEUR CAPT CDE SA
Part number	007142212Z
Compatibility	Floor pedal. Suspended pedal. Swash plate sensor.

Features

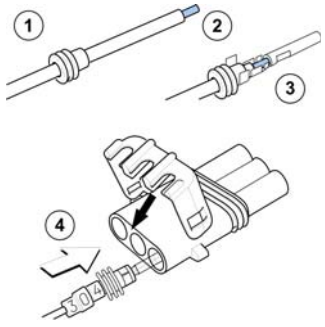
Manufacturer		DELPHI reference
Components	1x 3-way male connector	1201 5793
	3x Female contact	1208 9188
	3x Seal	1201 5323
Wire section	0.5 to 0.8 mm^2	
Insulation diameter	2 to 2.9 mm	
Operating temperature	-40°C to +125°C *[-40°F to +257°F]*	
Ingress protection	IP 67	

Connector mounting

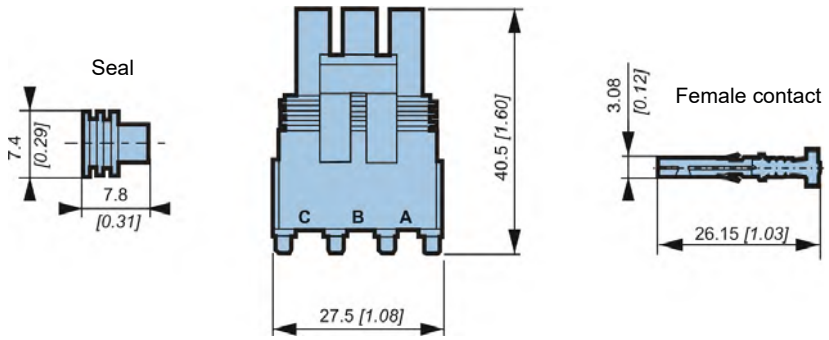
Locking device position

1. Fit a seal on each wire.
2. Strip 5 mm *[0.19 in]* off the wires.
3. Crimp the terminals with the 1201 4254 Packard Electric pliers, pinching the seal with the lug.
4. Plug the terminal into its compartment. If a terminal is wrongly inserted, use extraction tool Ref 1201 4012 to remove it.

   Fold down the connector latch.



Layout



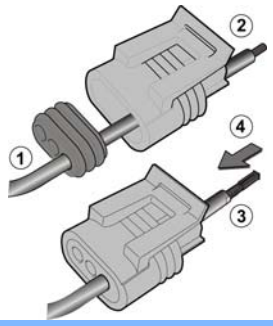
3-PIN METRI PACK CONNECTOR

Commercial name	KIT CONNECTEUR CAPT VIRAGE
Part number	007142222K
Compatibility	Floor pedal.
Manufacturer	DEPLHI

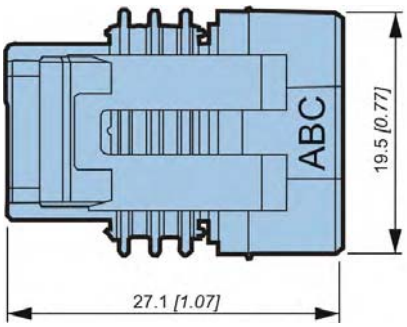
Features		DELPHI reference
Components	1x 3-way terminal connector	1216 2182
	4x Terminal	1212 4076
Wire section	0.35 to 0.60 mm^2	
Insulation diameter	1.30 to 2.20 mm	
Operating temperature	-40°C to +125°C *[-40°F to +257°F]*	
Ingress protection	IP67	

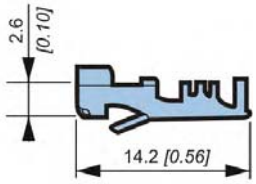
Connector mounting

1. Pass the wires through the connector.
2. Strip 5 mm from the wires.
3. Crimp the terminals with special tool 1203 9500.
4. Pull the wires towards the connector to fit the terminals into their housing.



Layout





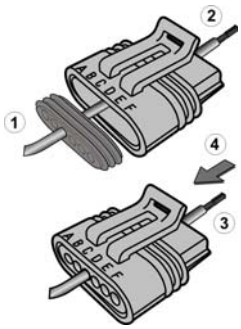
6-PIN METRI PACK CONNECTOR

Commercial name	KIT-CONNECT-6-PIN-MP
Part number	A38140G
Compatibility	Joystick with Z-gate
Manufacturer	DEPLHI

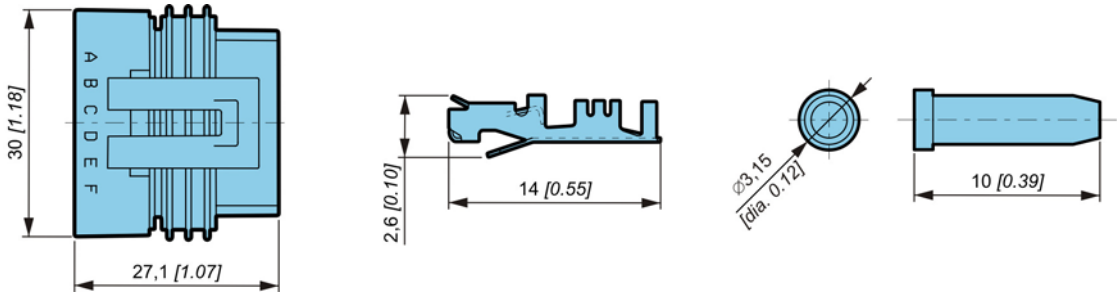
Features		DEPLHI reference
Components	1x Connector	1206 6317
	7x Pin	1210 3881
	3x Stopper	1206 5266
Wire section	0,8 to 1,0 mm^2	
Insulation diameter	2,03 to 2.40 mm	
Operating temperature	-40°C to +125°C *[-40°F to +257°F]*	
Ingress protection	IP67	

Connector mounting

1. Pass the wires through the connector.
2. Strip 5 mm from the wires.
3. Crimp the terminals with special tool 1203 9500.
4. Pull the wires towards the connector to fit the terminals into their housing.



Layout



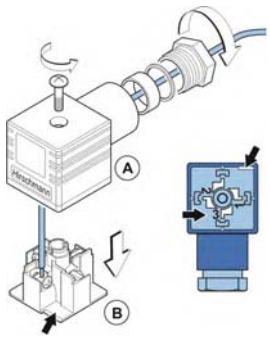
EN 175301 - 803 STYLE A CONNECTOR

Commercial name	KIT CONNECT CDE SA
Part number	007142211X
Compatibility	Proportional control electro-valve. Electro-valve solenoid control.
Manufacturer	Hirschmann

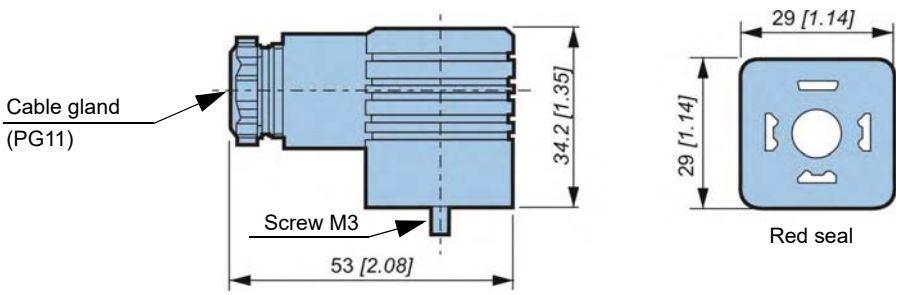
Features		Hirschmann reference
Standard	EN 175301 - 803 style A (DIN 43650)	
Components	2x Connector	GDM 2011
	2x Screw	
	2x Gasket	GDM-3-17
Max. currrent	16 A	
Max. voltage	250 V (AV)	
Wire section	max. 1.5 mm^2	
Cable diameter	6 mm *[0.24 in]* to 9 mm *[0.35 in]*	
Operating temperature	-40°C to +125°C *[-40°F to +257°F]*	
Ingress Protection	IP65	

Connector mounting

1. Unscrew the packing gland and the screw.
2. Open the connector with a flat-headed screwdriver inserted in part B of the slot.
   Strip the wire over a length of 5 mm *[0.19 in]*.
   Pass the wire through the gland, then through the cover A.
   Plug the wire into B. Wire No.3 has to be earthed.
3. Re-assemble B and A: The "3" mark has to be nearest the gland.
   Refit the packing gland and the screw.



Layout



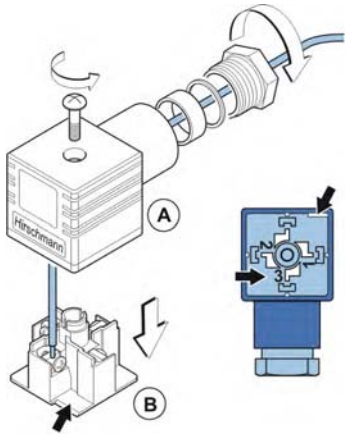
EN 175301 - 803 STYLE A CONNECTOR WITH DIODE

Commercial name	CONNECTOR-GDML-DIODE
Part number	A37605A
Compatibility	On/Off control electro-valve.
Manufacturer	Hirschmann

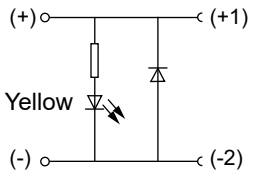
Features		Hirschmann reference
Standard	EN 175301 - 803 style A (DIN 43650)	
Components	1x Connector	GDML 2011 LED 24 HH YE
	1x Screw M3x35	
	1x Gasket	GDM 3-7
Max. current	8 A	
Max. voltage	24 V DC (use 12 V and 24 V DC)	
Wire section	max. 1.5 mm^2	
Cable diameter	4.5 to 11 mm	
Operating temperature	-40°C to +90°C *[-40°F to +194°F]*	
Ingress Protection	IP65	

Connector mounting

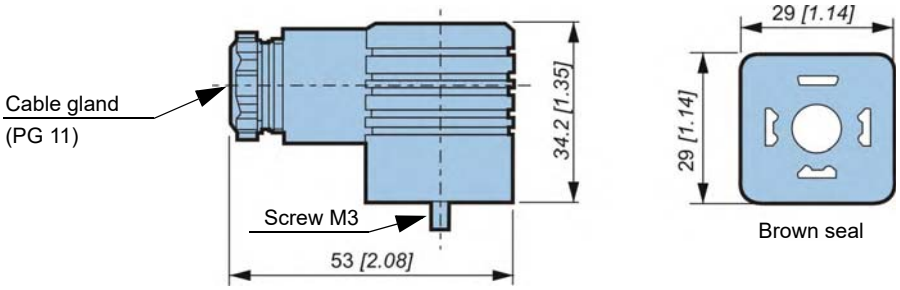
1. Unscrew the packing gland and the screw.
2. Open the connector with a flat-headed screwdriver inserted in part B of the slot.
   Strip the wire over a length of 5 mm *[0.19 in]*.
   Pass the wire through the gland, then through the cover A.
   Plug the wire into B. Wire No.3 has to be earthed.
3. Re-assemble B and A: The "3" mark has to be nearest the gland.
   Refit the packing gland and the screw.



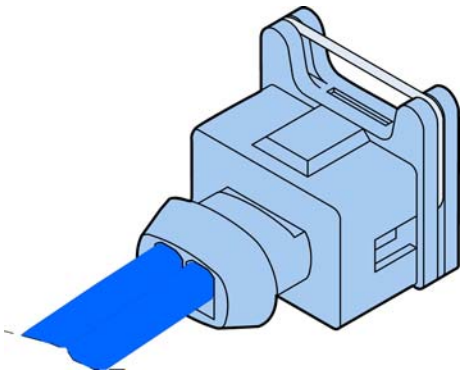
You should respect the polarity as shown in the diagram below.



Layout


Cable gland
(PG 11)
Screw M3
53 [2.08]
34.2 [1.35]
29 [1.14]
29 [1.14]
Brown seal

2-PIN AMP TIMER JUNIOR CONNECTOR

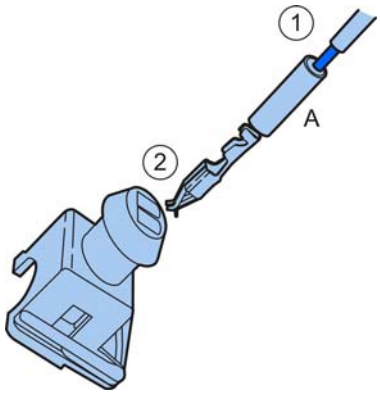


Commercial name	VMA CONNECTOR VALVE KIT
Part number	007142206S
Compatibility	In-line valve. Flanged valve.
Manufacturer	AMP

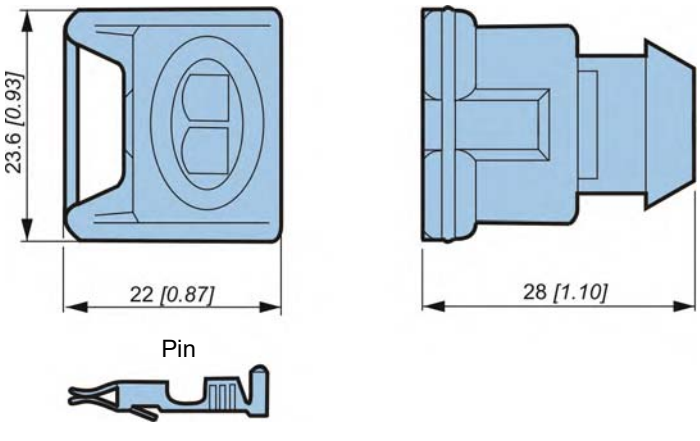
Features		AMP reference
Components	3x Contact	927 846 - 2
	1x Body connector	827 551 - 3
Wire section	0.5 to 1 mm^2	
Insulation diameter	1.4 to 2.1 mm	

Connector mounting

1. Strip 5 mm *[0.19 in]* of insulation off the cables. Crimp the lugs using an AMP CERTI-LOCK 169400 tool. Protect the connection with heat-shrink tubing (A), or Rislon fixed plastic tubing.
2. Refer to your general wiring diagram, inserting each lug into its housing until it clicks into place.



Layout



2-PIN DEUTSCH DT CONNECTOR

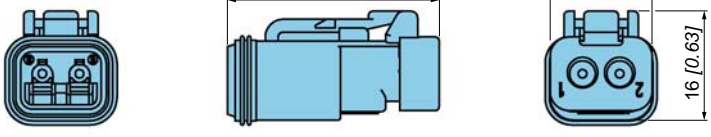
Commercial name	KIT-CONNECT-2-PIN-DEUTSCH
Part number	A42310P
Compatibility	PM and PH1 pump
Manufacturer	DEUTSCH

Features		DEUTSCH reference
Components	1x Connector	DT06-2S
	1x Wedgelock	W2S-P012
	3x Socket contact	0462-201-16141
Wire section	0.5 to 0.1 mm^2	
Cable diameter	2.23 to 3.68 mm	
Operating temperature	-55°C to +125°C *[-40°F to +257°F]*	
Ingress Protection	IP67	

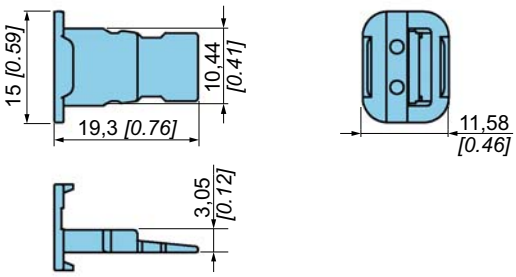
Mounting tool
Crimp tool: HDT-48-00

Layout

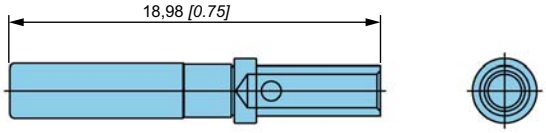
Connector



Wedgelock



Socket contact



3-PIN DEUTSCH DT CONNECTOR

Commercial name	KIT-CONNECT-3-PIN-DEUTSCH
Part number	B62766X
Compatibility	Pressure sensor
Manufacturer	DEUTSCH

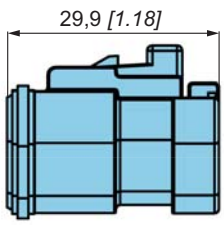
Features		DEUTSCH reference
Components	1x Connector	DT06-3S-CE05
	1x Wedgelock	W3S-P012
	4x Socket contact	0462-201-16141
Wire section	0.5 to 0.1 mm^2	
Cable diameter	1.35 to 3.05 mm	
Operating temperature	-55°C to +125°C *[-40°F to +257°F]*	
Ingress Protection	IP67	

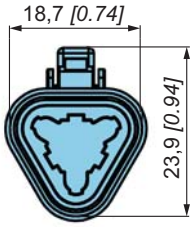
Mounting tool

Crimp tool: HDT-48-00

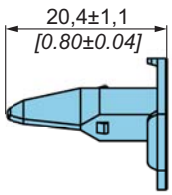
Layout

Connector

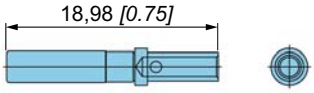




Wedgelock



Socket contact



3-PIN DEUTSCH DTM CONNECTOR

Commercial name	KIT-CONNECT-DTM-3S-NW8.5
Part number	B02468G
Compatibility	Position sensor
Manufacturer	DEUTSCH

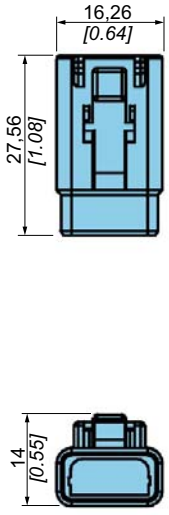
Features		DEUTSCH reference
Components	1x Connector	DTM 06-3S
	1x Backshell 180° NW8.5	1028-005-0305
	1x Wedgelock	WM-3S
	4x Contact	0462-201-20141
Wire section	0.2 to 0.5 mm^2	
Cable diameter	1.35 to 3.05 mm	
Operating temperature	-55°C to +125°C *[-40°F to +257°F]*	
Ingress Protection	IP6K9K	

Mounting tool

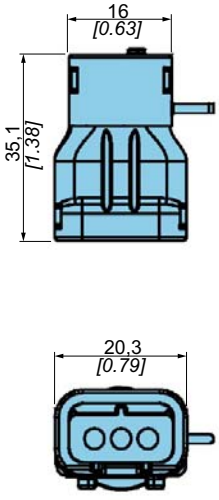
Crimp tool: HDT-48-00

Layout

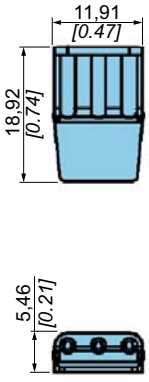
3 pins DTM connector



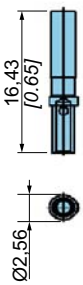
Backshell



Wedgelock



Socket contact



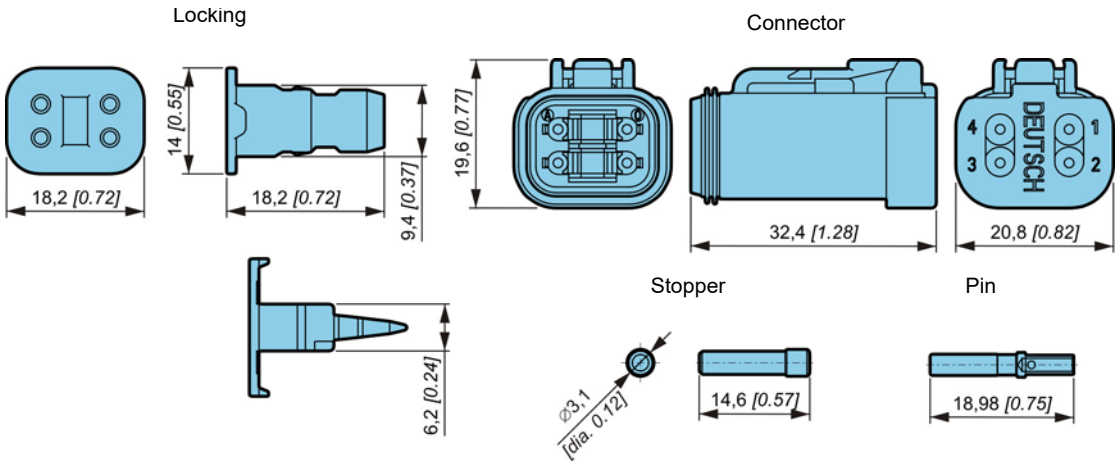
4-PIN DEUTSCH DT CONNECTOR

Commercial name	KIT-CONNECT-4-PIN-DEUTSCH
Part number	A39961L
Compatibility	Joystick with Z-gate
Manufacturer	DEUTSCH

Features		DEUTSCH reference
Components	1x Connector	DT06-4S-EP06
	5x Pin	0462-201-16141
	1x Stopper	114017
	1x Locking	W4S-P012
Wire section	0,5 to 1,0 mm^2	
Insulation diameter	2,23 to 3.68 mm	
Operating temperature	-55°C to +125°C *[-67°F to +257°F]*	
Ingress protection	IP67	

Mounting tools	
Crimpers	HDT-48-00

Layout



4-PIN DIN72585 IP6K9K CONNECTOR

Commercial name	KIT-CONNECT-4-PIN-DIN72585
Part number	B02394B
Compatibility	Pressure sensor, Temperature sensor
Manufacturer	TYCO

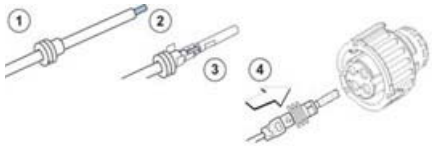
Features		TYCO reference
Components	1x DIN connector socket 4 pins	1-967325-1
	1x Cap 90° NW8.5	965577-1
	4x Socket contacts	962981-1
	4x Single wire seals	828920-1
	2x Cavity plugs	828922-1
Wire section	0.5 to 1mm²	
Insulation diameter	1.2 to 2.1 mm *[0.05 to 0.11 in]*	
Operating temperature	-40°C to +130°C *[-40°F to 257°F]*	
Ingress protection	IP6K9K	

Mounting tool

Crimp tool :AMP 734289-1

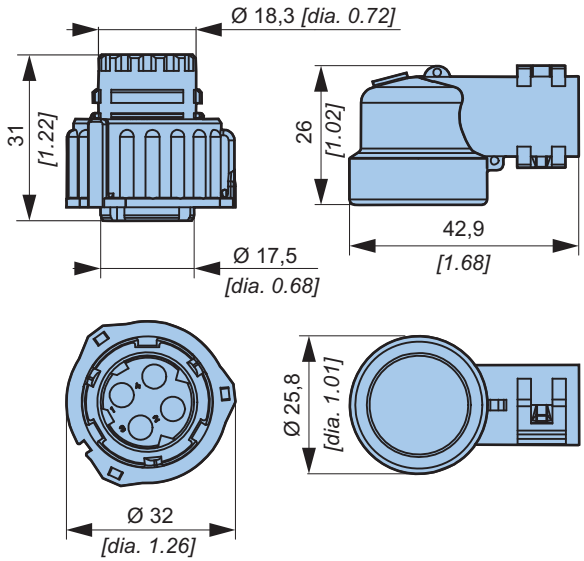
Connector mounting

1. Fit a seal on each wire
2. Strip 5 mm *[0.19 in]* off the wires.
3. Crimp the socket contacts with the 734289-1 hand tool pliers in position 2 for wire range 0.5 to 1mm², pinching the seal with the lug.
4. Plug the terminal into its compartment. If a terminal is wrongly inserted, use extraction tool AMP Ref. 1-1579007-8 to remove it.



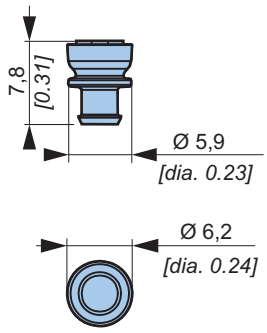
Layout

DIN connector socket 4 pins

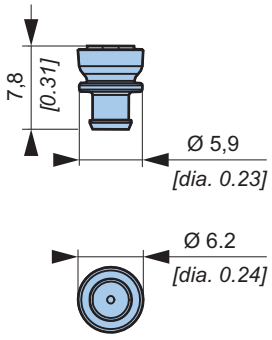


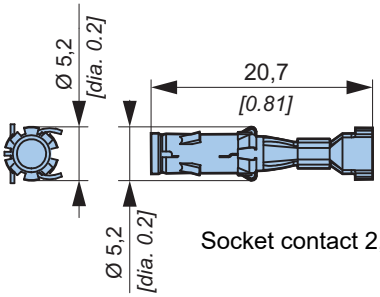
Cap 90° NW8.5

Cavity plug



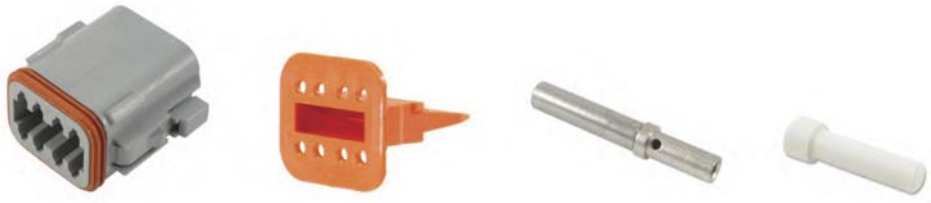
Single wire seal





Socket contact 2,5 mm

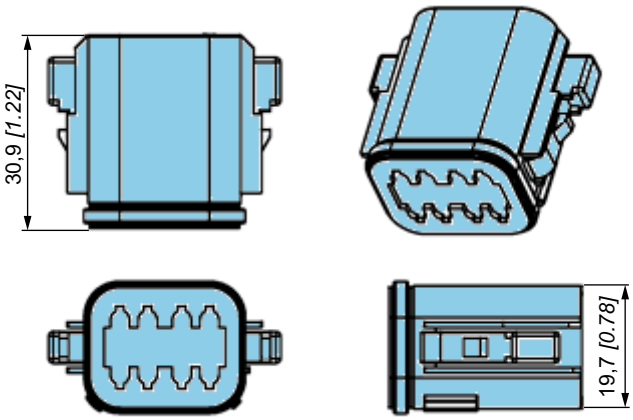
INCLINOMETER CONNECTOR



Commercial name	KIT-CONNECT-DT8-F
Part number	B47711J
Compatibility	Inclinometer
Manufacturer	DEUTSCH

Features		DEUTSCH reference
Components	1x Connector	DT06-08SA
	1x Wedgelock	W8S
	8x Pin 16-20 AWG	0462-201-16141
	8x Stopper	114017
Insulation diameter	2,24 to 3,68 mm *[0.09 to 0.14 in]*	
Operating temperature	-55°C to +125°C *[-67°F to 257°F]*	
Current	13 A	
Ingress protection	IP67	

Mounting tool



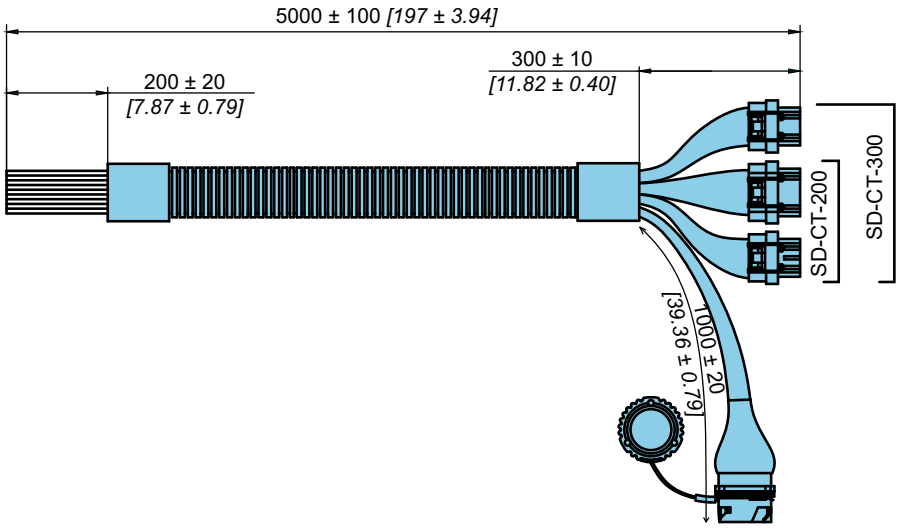
SMARTDRIVE™ CT CABLE

Commercial name	CABLE-SD-CT-200-60-5000	CABLE-SD-CT-300-86-5000
Part number	A48878D	A48877C
Function	Connect SmartDrive™ CT to the machine wiring and have a male communication connector.	
Compatibility	Transmission management with SmartDrive™ CT	
Features		
Length of cable	5m	5m
Operating temperature	- 40°C to 85°C *[-40 °F to 185°F]*	
Ingress protection	IP67 according to IEC 60529	
Number of wires	60	86
Number of stoppers	50 (Tyco ref: 4-1437284-3)	75 (Tyco ref: 4-1437284-3)
Wire section	0,75 mm² *[0.029 in²]* for signals 1 mm² *[0.039 in²]* for VBAT_P and power outputs 1,25 mm² *[0.049 in²]* for VBAT_D1, VBAT_D2, VBAT_D3 and -VBAT	
Insulation diameter	1,6 to 2,2 mm *[0.063* to *0.086 in]*	

Each wire is numbered with locating pin and connector.
For the CAN bus, the identification is performed by different colour for each pin. (see table - CAN Wire colour)

CAN Wire colour	
Function	Colour
CAN1_High	White
CAN1_Low	Green
CAN2_High	White
CAN2_Low	Red
CAN3_High	White
CAN3_Low	Blue

Dimensions



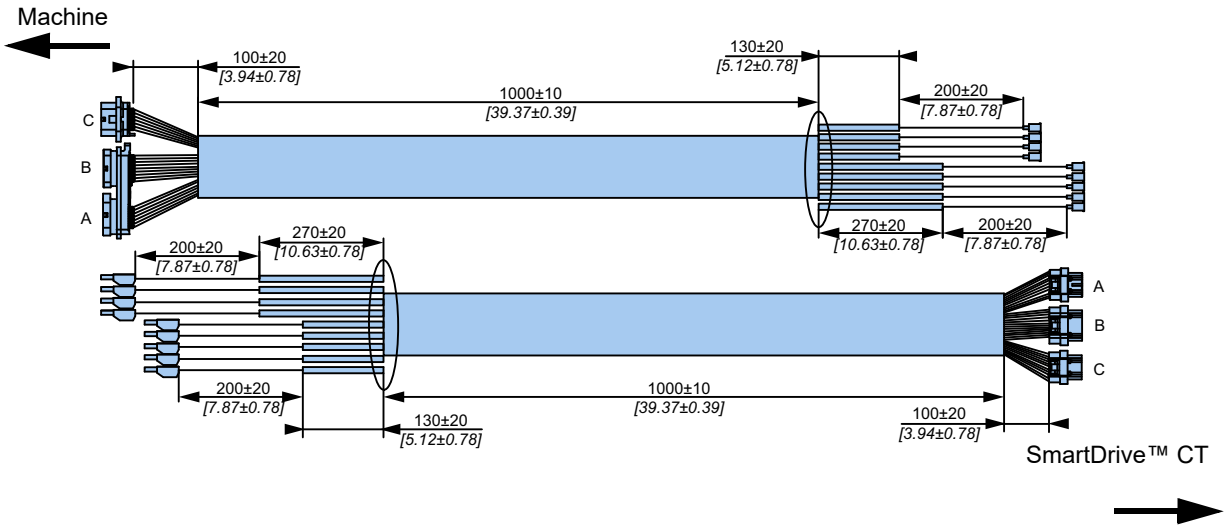
Unused wires should be individually insulated because of possible voltage.

In case some wires are removed, stoppers must be inserted in connector cavity to ensure the sealing.

SMARTDRIVE™ CT TEST CABLE

Commercial name	CABLE-TEST-BOX-86-WAY-CT300
Part number	B04164A
Function	Check the wiring by isolation each wire between the machine and the Electronic Unit (workshop use)
Compatibility	Transmissions controlled by a unit in the SmartDrive™ CT range
Features	
Lenght of cable	3000 mm
Maximum volatge	32 VDC
Operating Temperature	-40 °C to 80 °C *[-40 °F to 176 °F]*
Material	PVC for wires, Polyester for Braided sheath
Number of wires	86
Section of wires	1 mm²

Layout



Electrical wiring

The wires of the cable are numbered and have different colors

Connector A SD-CT300		
Number PIN	**Number wire**	**Color wire**
1	A-1	Green
2	A-2	Green
3	A-3	Green
4	A-4	Green
5	A-5	Green
6	A-6	Green
7	A-7	Green
8	A-8	Green
9	A-9	Green
10	A-10	Brown
11	A-11	Brown
12	A-12	Brown
13	A-13	Brown
14	A-14	Brown
15	A-15	Brown
16	A-16	Brown
17	A-17	Brown
18	A-18	Brown
19	A-19	Brown
20	A-20	Red
21	A-21	Red
22	A-22	Red
23	A-23	Red
24	A-24	Red
25	A-25	Red
26	A-26	Red

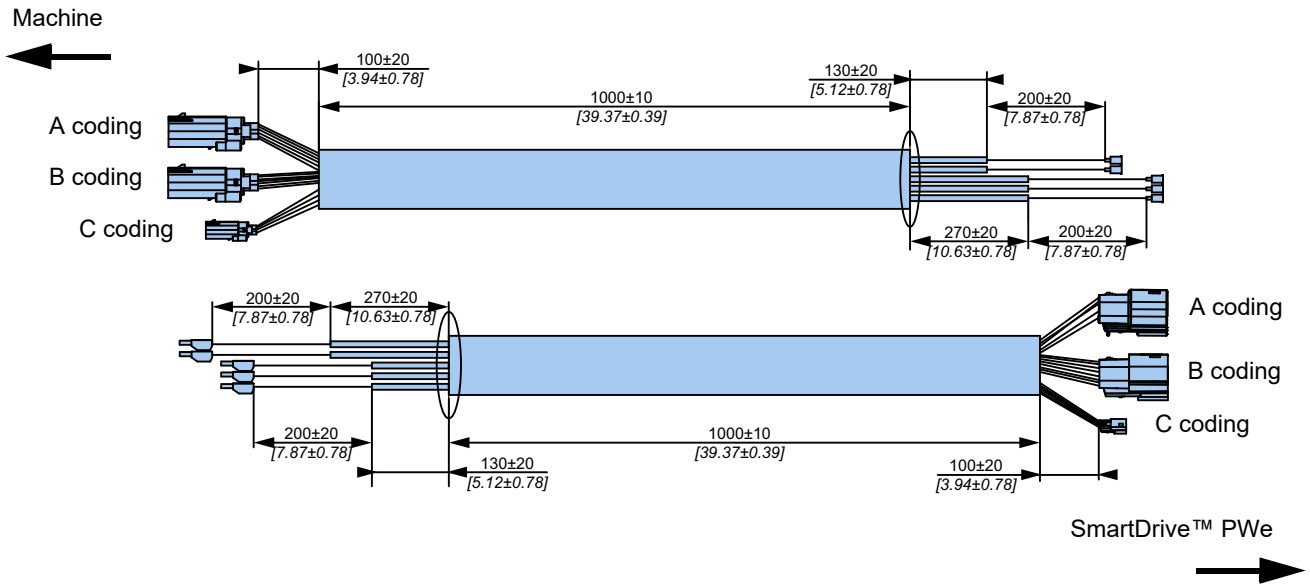
Connector A SD-CT300		
Number PIN	**Number wire**	**Color wire**
61	C-1	Orange
62	C-2	Orange
63	C-3	Orange
64	C-4	Orange
65	C-5	Orange
66	C-6	Orange
67	C-7	Orange
68	C-8	Orange
69	C-9	Orange
70	C-10	White
71	C-11	White
72	C-12	White
73	C-13	White
74	C-14	White
75	C-15	White
76	C-16	White
77	C-17	White
78	C-18	White
79	C-19	White
80	C-20	Grey
81	C-21	Grey
82	C-22	Grey
83	C-23	Grey
84	C-24	Grey
85	C-25	Grey
86	C-26	Grey

Connector B SD-CT300		
Number PIN	**Number wire**	**Color wire**
27	B-1	Red
28	B-2	Red
29	B-3	Red
30	B-4	Yellow
31	B-5	Yellow
32	B-6	Yellow
33	B-7	Yellow
34	B-8	Yellow
35	B-9	Yellow
36	B-10	Yellow
37	B-11	Yellow
38	B-12	Yellow
39	B-13	Yellow
40	B-14	Black
41	B-15	Black
42	B-16	Black
43	B-17	Black
44	B-18	Black
45	B-19	Black
46	B-20	Black
47	B-21	Black
48	B-22	Black
49	B-23	Black
50	B-24	Blue
51	B-25	Blue
52	B-26	Blue
53	B-27	Blue
54	B-28	Blue
55	B-29	Blue
56	B-30	Blue
57	B-31	Blue
58	B-32	Blue
59	B-33	Blue
60	B-34	Orange

SMARTDRIVE™ PWE TEST CABLE

Commercial name	CABLE-TEST-BOX-42-WAY-PWE
Part number	B04166C
Function	Check the wiring by isolation each wire between the machine and the Electronic Unit (workshop use)
Compatibility	Transmissions controlled by a unit in the SmartDrive™ PWE
Features	
Lenght of cable	3000 mm
Maximum voltage	32 VDC
Operating Temperature	-40 °C to 80 °C *[-40 °F to 176 °F]*
Material	PVC for wires, Polyester for Braided sheath
Number of wires	42
Section of wires	1 mm²

Layout



Electrical wiring

The wires of the cable are numbered and have different colors

Connector Molex A codding		
Number wire	**Number pin**	**Color wire**
A-1	**1**	Green
A-2	**2**	Green
A-3	**3**	Green
A-4	**4**	Green
A-5	**5**	Green
A-6	**6**	Green
A-7	**7**	Green
A-8	**8**	Green
A-9	**9**	Green
A-10	**10**	Brown
A-11	**11**	Brown
A-12	**12**	Brown
A-13	**13**	Brown
A-14	**14**	Brown
A-15	**15**	Brown
A-16	**16**	Brown
A-17	**17**	Brown
A-18	**18**	Brown
A-19	**19**	Brown
A-20	**20**	Red

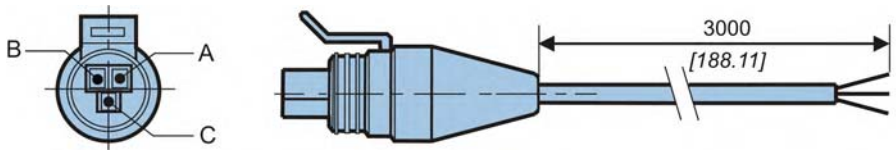
Connector Molex B coding		
Number PIN	**Number wire**	**Color wire**
B-1	**1**	Red
B-2	**2**	Red
B-3	**3**	Red
B-4	**4**	Yellow
B-5	**5**	Yellow
B-6	**6**	Yellow
B-7	**7**	Yellow
B-8	**8**	Yellow
B-9	**9**	Yellow
B-10	**10**	Yellow
B-11	**11**	Yellow
B-12	**12**	Yellow
B-13	**13**	Yellow
B-14	**14**	Yellow
B-15	**15**	Yellow
B-16	**16**	Yellow
B-17	**17**	Yellow
B-18	**18**	Yellow
B-19	**19**	Yellow
B-20	**20**	Black

Connector Molex C coding		
Number PIN	**Number wire**	**Color wire**
C-1	**1**	Black
C-2	**2**	Black

PRESSURE SENSORS CABLE

Commercial name	CABLE-PRESSURE-SENSOR-3M
Part number	003141105U
Features	
Lenght of cable	3 m
Material	PVC
Number of wires	3
Sections of wires	0.5 mm^2

Layout



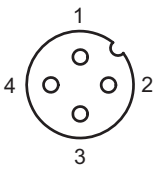
Electrical wiring

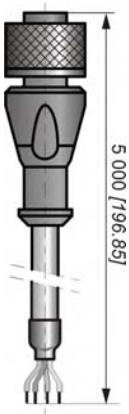
Pin	Wire
A	Green
B	Brown
C	White

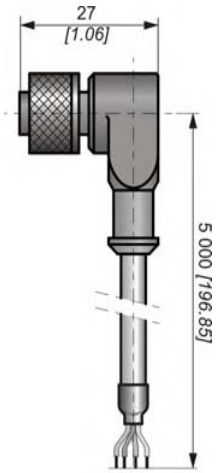
4-PIN M12 CABLE

Commercial name	ELEC-CABLE-M12-180°-5000	ELEC-CABLE- M12-90°-5000
Part number	A07468S	A04999J
Compatibility	Speed sensor, digital sensor and temperature sensor.	
Features		
Lenght of cable	5 m	
Material	PUR	
Number of wires	4	
Sections of wires	0.34 mm^2	
Protection	IP68	

Layout	180°	90°







Connector Mounting

Securely hand tighten the cable's ring to sensor connector M12.
The M12 nut must be tightened with a tightening torque from 0.6 Nm (hand-tight) to 1.5 Nm (using a torque wrench). An excessive tightening can damage the M12 connector.

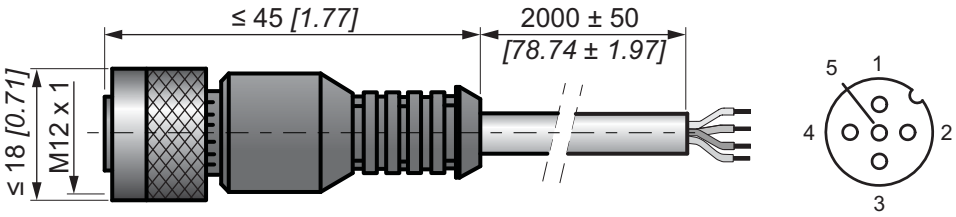
Electrical wiring

Pin	Wire
1	Brown
2	White
3	Blue
4	Black

5-PIN M12 CABLE

Commercial name	CABLE-M12-180°-2000-5PT
Part number	A19974L
Compatibility	Display 2.8-CR0451 and Display 4.3-CR0452
Features	
Lenght of cable	2 m
Material	PUR
Number of wires	5
Sections of wires	0.34 mm^2
Protection	IP68

Layout



Connector Mounting

Securely hand tighten the cable's ring to sensor connector M12.
The M12 nut must be tightened with a tightening torque from 0.6 Nm (hand-tight) to 1.5 Nm (using a torque wrench). An excessive tightening can damage the M12 connector.

Electrical wiring

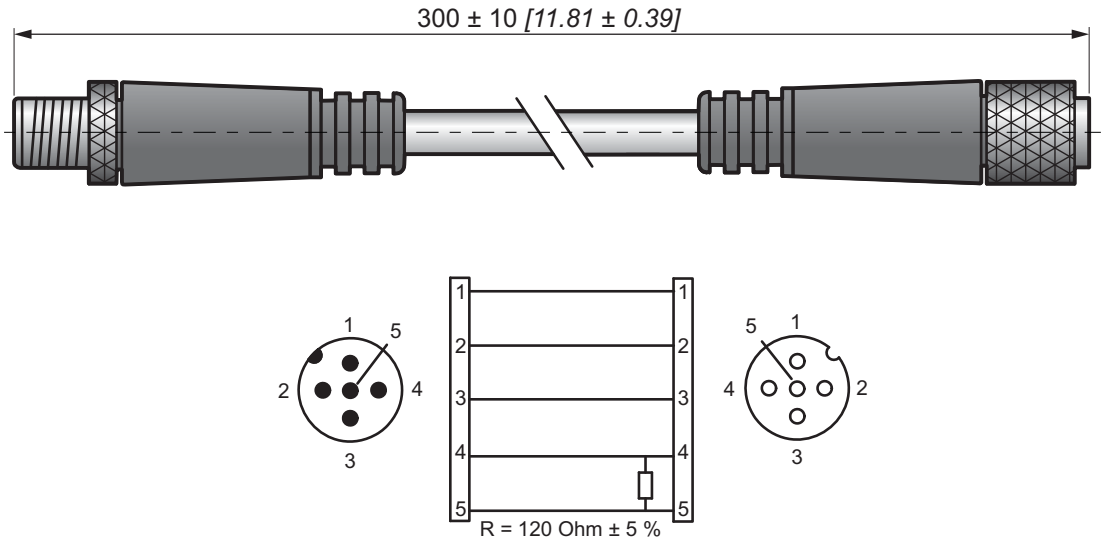
Pin	Wire
1	Brown
2	White
3	Blue
4	Black
5	Grey or Green-yellow

5-PIN M12 120 OHM CABLE

Commercial name	CABLE-COM-M12-CAN-120
Part number	A25657N
Function	120 ohm termination resistor for CAN bus
Compatibility	Display 2.8-CR0451 and Display 4.3-CR0452

Features	
Lenght of cable	0,3 m
Material	PUR
Number of wires	5
Sections of wires	0.34 mm^2
Protection	IP67

Layout



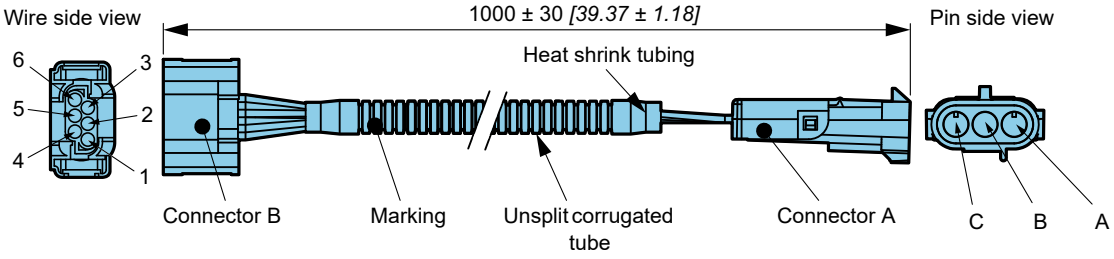
Connector Mounting

Securely hand tighten the cable's ring to sensor connector M12.
The M12 nut must be tightened with a tightening torque from 0.6 Nm (hand-tight) to 1.5 Nm (using a torque wrench). An excessive tightening can damage the M12 connector.

1 SIGNAL PEDAL CONNECTION CABLE

Commercial name	CABLE-AMP-65-WP-3P-1000
Part number	A51444S
Function	Connect to the pedal and use only 1 signal.
Compatibility	Electronic transmission management with SmartDrive™.
Features	
Lenght of cable	1 m
Material	corrugated tube + wires
Number of wires	3
Sections of wires	AWG20
Operating temperature	- 40°C + 85°C *[- 40°F + 185°F]*
Corrugated tube material	PA

Layout



Electrical wiring

Connector A:	Packard Electric
Connector:	12010717
Terminal:	12089040
Wire seal:	12015899
Connector B:	AMP
Connector:	1-967616-1
Terminal:	0-962885-5
Wire seal:	0-0967067-1
Cavity plug:	967056-1

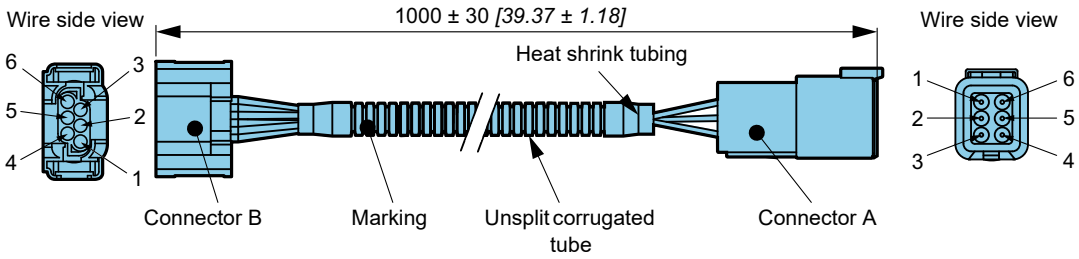
Pin allocation of connectors

Connector B	Connector A	Wire color
1	C	red
4	B	black
2	A	white
3	-	-
5	-	-
6	-	-

2 SIGNAL PEDAL CONNECTION CABLE

Commercial name	CABLE-AMP-65-DTM-6P-1000
Part number	A51445T
Function	Connect to the pedal and use 2 signals.
Compatibility	Electronic transmission management with SmartDrive™.
Features	
Lenght of cable	1 m
Material	corrugated tube + wires
Number of wires	6
Sections of wires	AWG20
Operating temperature	- 40°C + 85°C *[- 40°F + 185°F]*
Corrugated tube material	PA

Layout



Electrical wiring

Connector A:	DEUTSCH
Connector:	DTM04-6P
Terminal:	0460-202-2031
Wedgelock:	WM-6P
Connector B:	AMP
Connector:	1-967616-1
Terminal:	0-962885-5
Wire seal:	0-0967067-1
Cavity plug:	967056-1

Pin allocation of connectors

Connector B	Connector A	Wire color
2	1	white
4	2	black
1	3	red
5	4	blue
3	5	green
6	6	orange

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