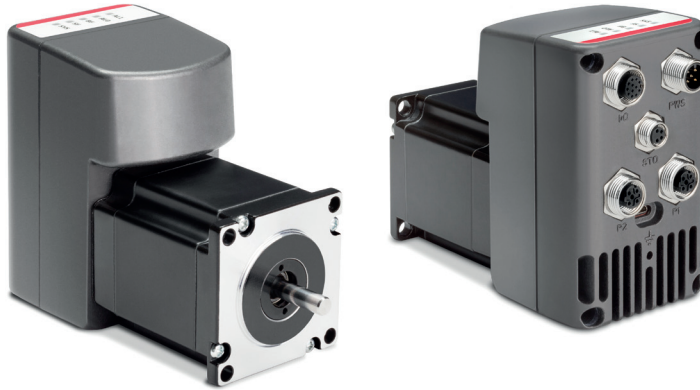


# Integrated field-oriented control drive Series DRVI



For stepper and brushless DC, Nema 23 and Nema 24 motors



- » Integrated solution: Encoder, motor, and drive all in one
- » Versatile: Control of different types of motors: brushless DC and stepper, Nema 23 and 24
- » Energy efficient: Compared to traditional stepper motors
- » Precise Positioning: With no loss of steps achieved through Field-Oriented Control
- » Different communication protocols: CANopen - Profinet - EtherCAT - Ethernet IP

The Series DRVI integrated motor drive is designed to control various types of motors, both stepper and brushless, using a closed-loop control (FOC) algorithm. This algorithm, also known as vector control (FOC), offers better performance than traditional stepper motor control systems, which allows the stepper motor to operate over the entire speed range, ensuring fast acceleration and deceleration, assuring more accurate motion control with no loss of steps.

It is also more energy efficient than traditional control methods, as it uses precise rotor position feedback and controls the phase current, optimising motor operation.

Its compact design and integration with the main communication protocols make the Series DRVI the ideal solution for various industrial applications that require accurate control and fast response to load variations.

**GENERAL DATA**

	DRVI-23ST012-0..	DRVI-24ST022-0..	DRVI-24EC125-0..
<b>Motor type</b>	Stepper	Stepper	Brushless DC
<b>Flange size</b>	NEMA 23	NEMA 24	NEMA 24
<b>Power supply</b>	24 - 48 VDC	24 - 48 VDC	24 - 48 VDC (nominal 48 V)
<b>Logic supply</b>		24 VDC	
<b>GPIO (General-purpose input/output)</b>		2 digital inputs, for sensors (Homing and extra-stroke) 2 general digital inputs 1 general digital output	
<b>IP protection</b>		IP65, except motor shaft. (Caps must be fitted to unused connectors to ensure IP protection)	
<b>Control loop</b>		Closed loop by field-oriented control (FOC)	
<b>Operation mode</b>		Position Speed Torque	
<b>Communication protocol</b>		Profinet CANopen EtherCAT EtherNet/IP	
<b>Additional function</b>		STO (Safe Torque Off), not certified	
<b>Rated speed [rpm]</b>	-	-	3000
<b>Max speed [rpm]</b>	3000	3000	3000
<b>Rated torque [Nm]</b>	-	-	0,5
<b>Peak torque [Nm]</b>	-	-	1,5
<b>Torque at 0 rpm at 24VDC [Nm]</b>	1,2	2,2	-
<b>Rated power [W]</b>	-	-	125
<b>Rotor inertia [kg cm<sup>2</sup>]</b>	0,38	0,78	0,91
<b>Permissible radial load [N]</b>		70N at End shaft	
<b>Mass moment of inertia of the rotor [gcm<sup>2</sup>]</b>	380	780	910
<b>Weight [kg]</b>	1,1	1,6	1,1
<b>Encoder type</b>		Absolute single turn	
<b>Recommended motor inertia ratio</b>		<1:10	
<b>Current Consumption [A]</b>		3,5 A	
<b>Current Consumption, logic [A]</b>		<0,2 A	
<b>General digital Input IN1, IN2</b>		isolated, compliant with IEC 61131-2 type 3	
<b>Sensor digital input Homing, External</b>		Ingresso isolato, differenziale, 24V	
<b>General digital output</b>		Protected isolated input, maximum 400mA <0.2	
<b>Maximum auxiliary current 24VDC [A]</b>		<0,13 A	
<b>Protection</b>		IZT, overvoltage, overcurrent, overtemperature	
<b>Operating temperature [°C] (no icing)</b>		0/+50°C	
<b>Humidity [%] (no condensing)</b>		15% - 90%	
<b>Installation max altitude [m]</b>		1000	
<b>Vibration resistance</b>		IEC 60068-2-6	
<b>Shock resistance</b>		IEC 60068-2-27	
<b>Brake resistance</b>		Not present	

**COMMUNICATION PROTOCOL DATA**

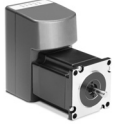
Fieldbus	Profinet	CANopen	EtherCAT	EtherNet/IP
<b>Communication profile</b>	Camozzi	CIA 402	CIA 402	Camozzi
<b>Node ID</b>	-	1-127	-	-
<b>Max fieldbus transmission rate [Mbps]</b>	100	1	100	100
<b>Terminator resistor</b>	-	Mandatory	-	-

## CODING EXAMPLE

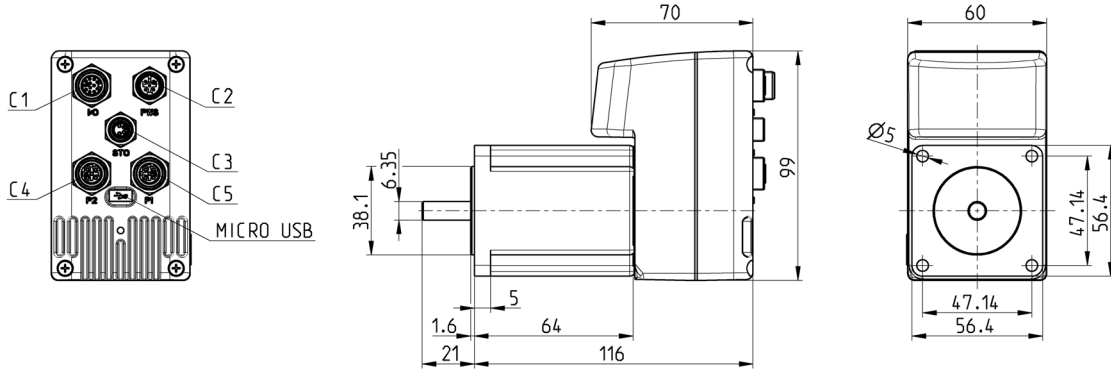
<b>DRVI</b>	<b>-</b>	<b>23</b>	<b>ST</b>	<b>012</b>	<b>-</b>	<b>0</b>	<b>E</b>	<b>-</b>	<b>PN</b>	<b>SF</b>
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<b>DRVI</b>	SERIES
<b>23</b>	MOTOR FLANGE 23 = Nema 23 24 = Nema 24
<b>ST</b>	MOTOR TYPE ST = stepper EC = brushless DC
<b>012</b>	MOTOR TORQUE 012 = 1,2 Nm (Nema 23) 022 = 2,2 Nm (Nema 24) 125 = 125 W (Only for EC)
<b>0</b>	MOTOR BRAKE 0 = without brake
<b>E</b>	MOTOR FEEDBACK E = absolute single turn encoder
<b>PN</b>	COMMUNICATION PROTOCOL PN = Profinet CO = CanOpen EC = EtherCAT EI = EtherNet/IP
<b>SF</b>	SAFETY FUNCTION = Standard SF = Safe torque off (not certified)

**Vector drive - Nema 23 stepper motor**

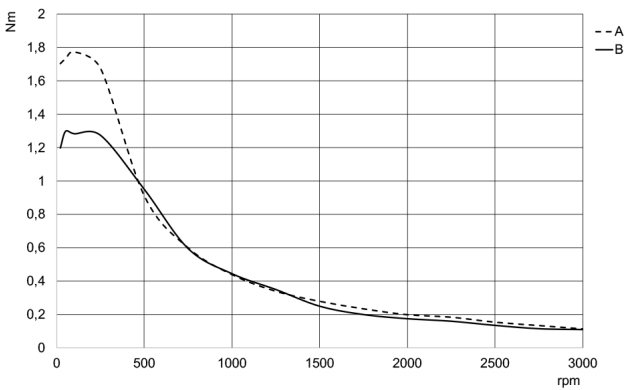


SERIES DRVI DRIVES



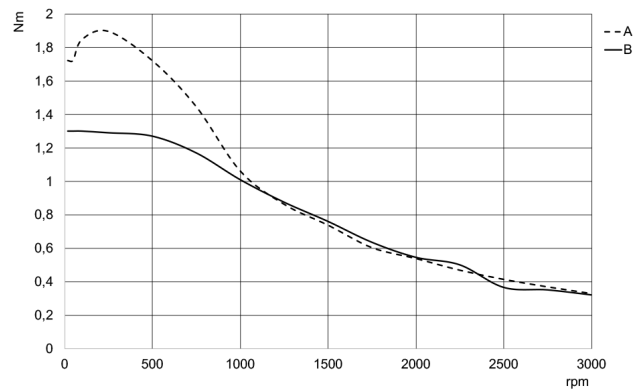
Description	Inputs/Outputs	Power supply	STO	Fieldbus interface	Fieldbus interface
DRVI-23ST012-0E-PN	M12 12P Female A-coded	M12 5P Male A-coded	-	M12 4P Female D-coded	M12 4P Female D-coded
DRVI-23ST012-0E-CO	M12 12P Female A-coded	M12 5P Male A-coded	-	M12 5P Female A-coded	M12 5P Male A-coded
DRVI-23ST012-0E-EC	M12 12P Female A-coded	M12 5P Male A-coded	-	M12 4P Female D-coded	M12 4P Female D-coded
DRVI-23ST012-0E-EI	M12 12P Female A-coded	M12 5P Male A-coded	-	M12 4P Female D-coded	M12 4P Female D-coded
DRVI-23ST012-0E-PNSF	M12 12P Female A-coded	M12 5P Male A-coded	M8 4P Female A-coded	M12 4P Female D-coded	M12 4P Female D-coded
DRVI-23ST012-0E-COSF	M12 12P Female A-coded	M12 5P Male A-coded	M8 4P Female A-coded	M12 5P Female A-coded	M12 5P Male A-coded
DRVI-23ST012-0E-ECSF	M12 12P Female A-coded	M12 5P Male A-coded	M8 4P Female A-coded	M12 4P Female D-coded	M12 4P Female D-coded
DRVI-23ST012-0E-EISF	M12 12P Female A-coded	M12 5P Male A-coded	M8 4P Female A-coded	M12 4P Female D-coded	M12 4P Female D-coded

**Torque curve at 24 VDC**



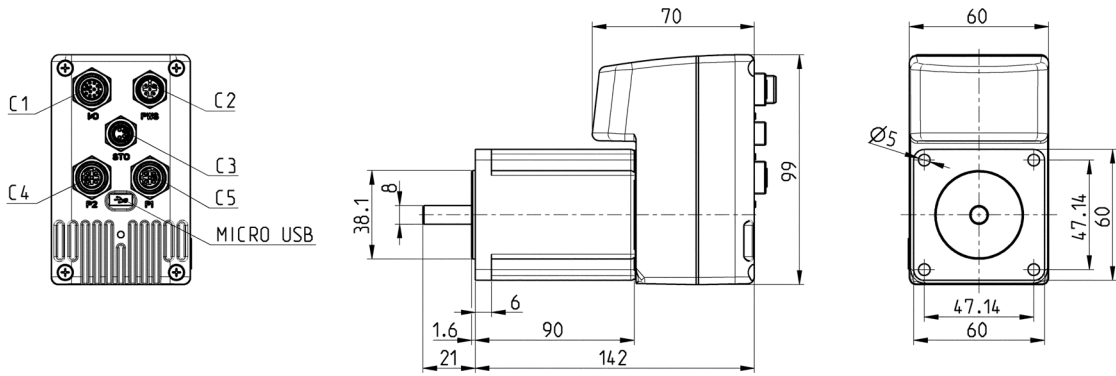
A = peak torque  
B = nominal torque

**Torque curve at 48 VDC**



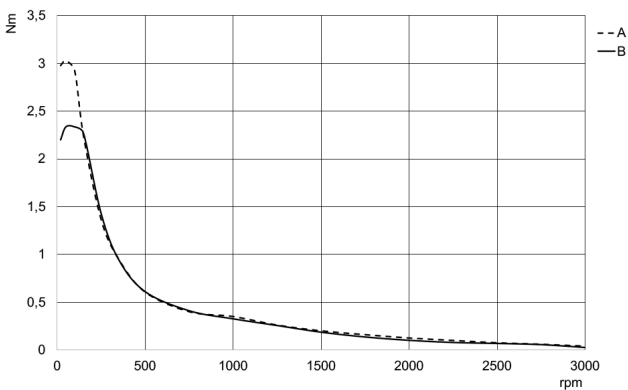
A = peak torque  
B = nominal torque

## Vector drive - Nema 24 stepper motor



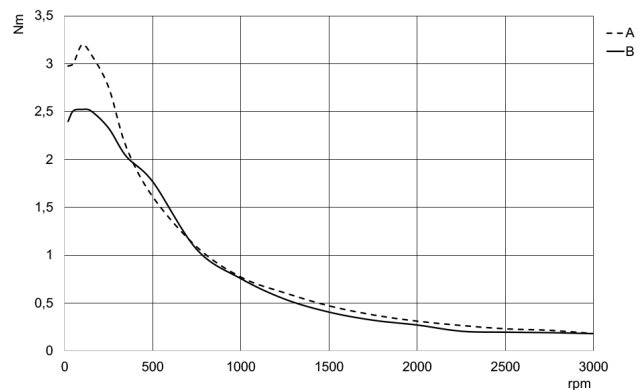
Description	Inputs/Outputs	Power supply	STO	Fieldbus interface	Fieldbus interface
DRVI-24ST022-0E-PN	M12 12P Female A-coded	M12 5P Male A-coded	-	M12 4P Female D-coded	M12 4P Female D-coded
DRVI-24ST022-0E-CO	M12 12P Female A-coded	M12 5P Male A-coded	-	M12 5P Female A-coded	M12 5P Male A-coded
DRVI-24ST022-0E-EC	M12 12P Female A-coded	M12 5P Male A-coded	-	M12 4P Female D-coded	M12 4P Female D-coded
DRVI-24ST022-0E-EI	M12 12P Female A-coded	M12 5P Male A-coded	-	M12 4P Female D-coded	M12 4P Female D-coded
DRVI-24ST022-0E-PNSF	M12 12P Female A-coded	M12 5P Male A-coded	M8 4P Female A-coded	M12 4P Female D-coded	M12 4P Female D-coded
DRVI-24ST022-0E-COSF	M12 12P Female A-coded	M12 5P Male A-coded	M8 4P Female A-coded	M12 5P Female A-coded	M12 5P Male A-coded
DRVI-24ST022-0E-ECSF	M12 12P Female A-coded	M12 5P Male A-coded	M8 4P Female A-coded	M12 4P Female D-coded	M12 4P Female D-coded
DRVI-24ST022-0E-EISF	M12 12P Female A-coded	M12 5P Male A-coded	M8 4P Female A-coded	M12 4P Female D-coded	M12 4P Female D-coded

Torque curve at 24 VDC



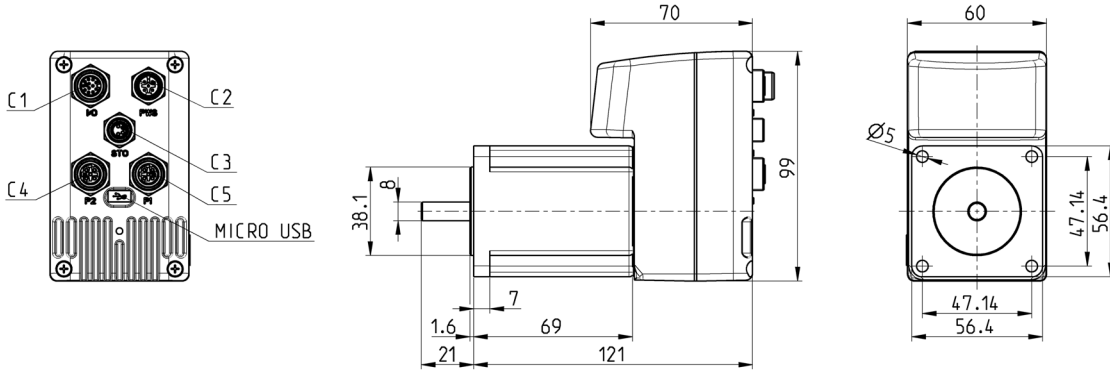
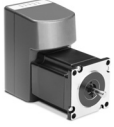
A = peak torque  
B = nominal torque

Torque curve at 48 VDC



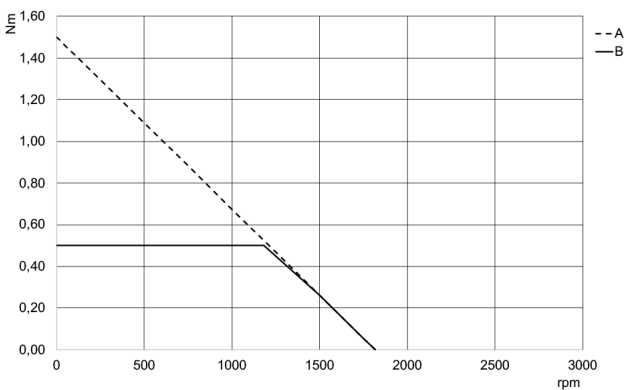
A = peak torque  
B = nominal torque

**Vector Drive - Nema 24 BLDC Motor**



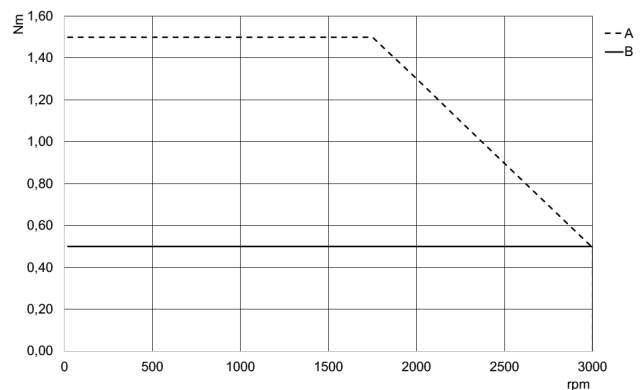
Description	Inputs/Outputs	Power supply	STO	Fieldbus interface	Fieldbus interface
DRVI-24EC125-0E-PN	M12 12P Female A-coded	M12 5P Male A-coded	-	M12 4P Female D-coded	M12 4P Female D-coded
DRVI-24EC125-0E-CO	M12 12P Female A-coded	M12 5P Male A-coded	-	M12 5P Female A-coded	M12 5P Male A-coded
DRVI-24EC125-0E-EC	M12 12P Female A-coded	M12 5P Male A-coded	-	M12 4P Female D-coded	M12 4P Female D-coded
DRVI-24EC125-0E-EI	M12 12P Female A-coded	M12 5P Male A-coded	-	M12 4P Female D-coded	M12 4P Female D-coded
DRVI-24EC125-0E-PNSF	M12 12P Female A-coded	M12 5P Male A-coded	M8 4P Female A-coded	M12 4P Female D-coded	M12 4P Female D-coded
DRVI-24EC125-0E-COSF	M12 12P Female A-coded	M12 5P Male A-coded	M8 4P Female A-coded	M12 5P Female A-coded	M12 5P Male A-coded
DRVI-24EC125-0E-ECSF	M12 12P Female A-coded	M12 5P Male A-coded	M8 4P Female A-coded	M12 4P Female D-coded	M12 4P Female D-coded
DRVI-24EC125-0E-EISF	M12 12P Female A-coded	M12 5P Male A-coded	M8 4P Female A-coded	M12 4P Female D-coded	M12 4P Female D-coded

**Torque curve at 24 VDC**



A = peak torque  
B = nominal torque

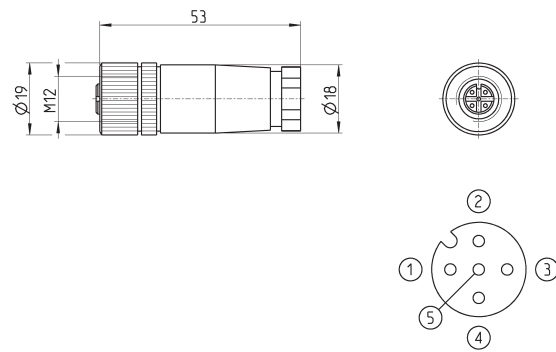
**Torque curve at 48 VDC**



A = peak torque  
B = nominal torque

## Straight connector for power supply

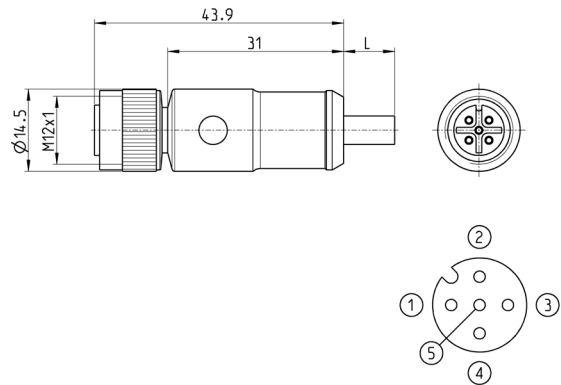
Connector for power supplies (PWR)



Mod.	description	type of connector	connection	cable length (m)
CS-LF04HB	for wiring	straight	M12 A 4 pin female - Pin 5 is not connected	-

## Cable with M12 5 pin connector, female, shielded

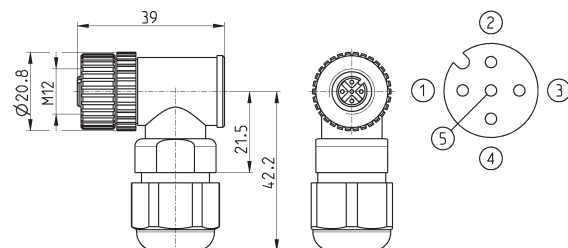
Cable for power supplies (PWR)



Mod.	description	type of connector	connection	cable length (m)
CS-LF05HB-D200	moulded cable	straight	M12, 5 pin, female	2
CS-LF05HB-D500	moulded cable	straight	M12, 5 pin, female	5

## Female connector 90°

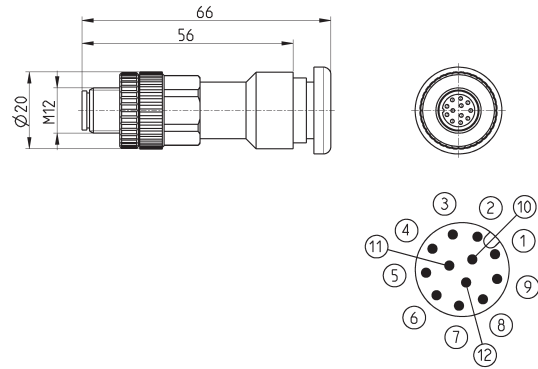
Connector for power supplies (PWR)



Mod.	description	type of connector	connection	cable length (m)
CS-LR05HC	for wiring	90°	M12, 5 pin female	-

### M12 male connector

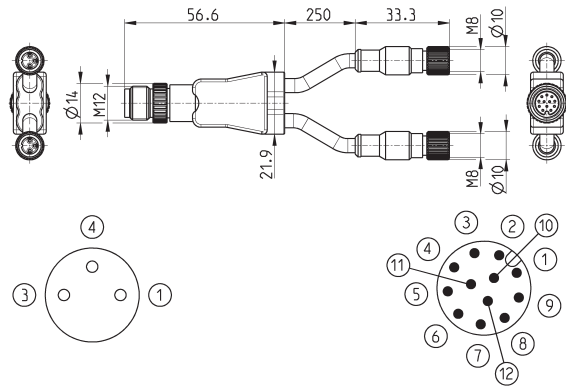
General Purpose Input/Output (GPIO)



Mod.	description	type of connector	connection	cable length (m)
CS-LM12HC	for wiring	straight	M12 12 pin male	-

### Y-cable with straight and M12 / 12 pin and M8 / 6 pin connectors (proximity)

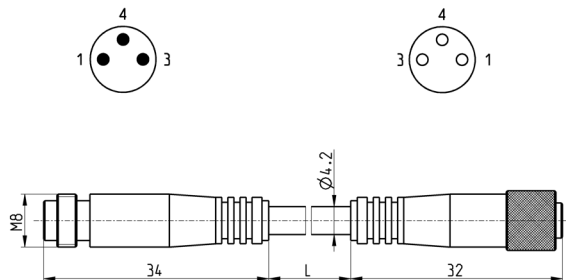
General Purpose Input/Output (GPIO)



Mod.	description	type of connector	connection	cable length (m)
CS-LO12HC-D025	for wiring	straight	M12 12 pin male + 2 x M8 PIN female	0,25

### Extension with M8 connector, 3 pin male/female (Non shielded)

General Purpose Input/Output (GPIO)

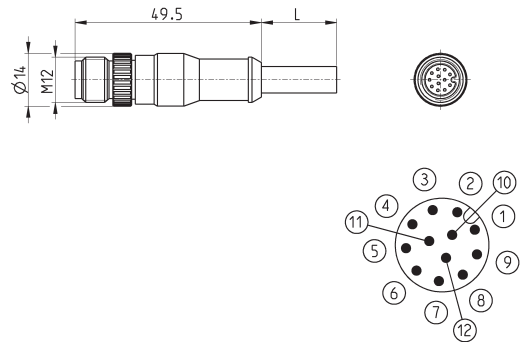


Mod.	description	type of connector	connection	L [ cable length ] (m)
CS-DW03HB-C250	moulded cable	straight	M8 3 pin male / female	2,5
CS-DW03HB-C500	moulded cable	straight	M8 3 pin male / female	5



### Cable with M12, 12-pin male connector, straight

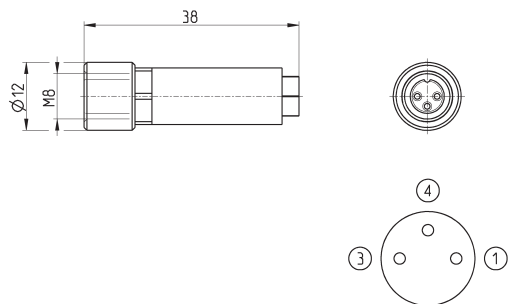
General Purpose Input/Output (GPIO)



Mod.	description	type of connector	connection	cable length (m)
CS-LM12HC-D500	moulded cable	straight	M12, 12 pin male	5

### M8 3 pin female connector

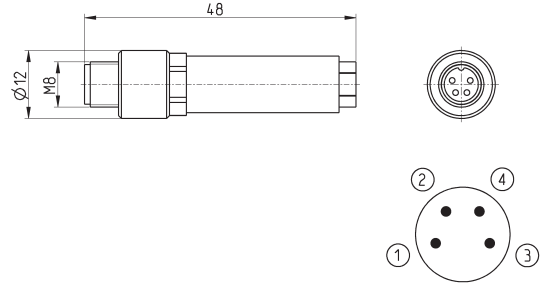
General Purpose Input/Output (GPIO)



Mod.	description	type of connector	connection	cable length (m)
CS-DF03HB	for wiring	straight	M8 3 pin female	-

## M8 4 pin male connector

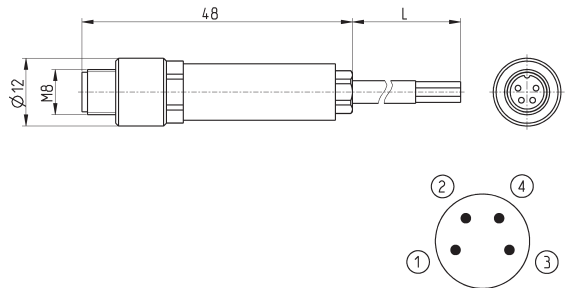
Safe Torque Off (STO)



Mod.	description	type of connector	connection	cable length (m)
CS-DM04HB	for wiring	straight	M8 4 pin male	-

## Cable with M8 4-pole male connectors, straight

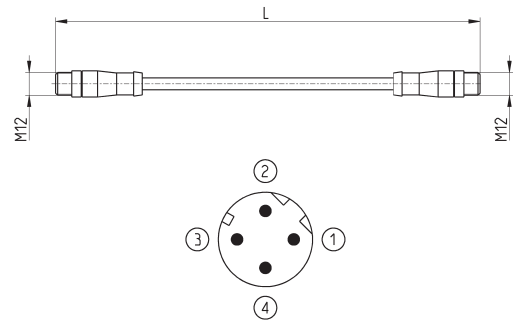
Safe Torque Off (STO)



Mod.	description	type of connector	connection	cable length (m)
CS-LM04HB-D500	moulded cable	straight	M8, 4 pin male	5

## Cables with straight connectors

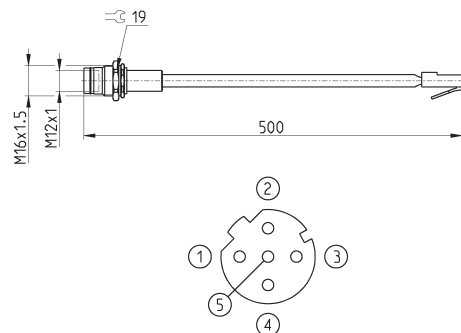
Profinet, EtherCAT, EtherNet/IP



Mod.	description	type of connector	connection	cable length (m)
CS-SB04HB-D100	moulded cable	straight	2x M12 D 4 pin male	1 mt
CS-SB04HB-D500	moulded cable	straight	2x M12 D 4 pin male	5 mt
CS-SB04HB-DA00	moulded cable	straight	2x M12 D 4 pin male	10 mt

## Adaptor and panel mount for Ethernet RJ45 to M12 networks

Profinet, EtherCAT, EtherNet/IP

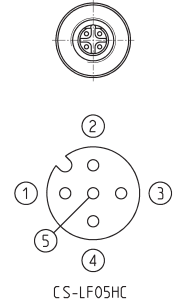
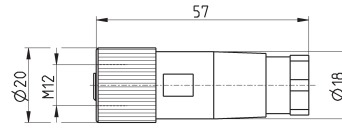


Mod.	description	type of connector	connection	cable length (m)
CS-SE04HB-F050	moulded cable	straight	RJ45 male, M12 D 4 pin female - Pin 5 is not connected	0,5

### Straight female M12 connector for Bus-IN



CANopen



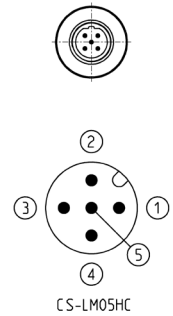
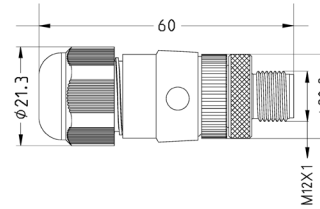
CS-LF05HC

Mod.	description	type of connector	connection	Fieldbus
CS-LF05HC	for wiring	straight	M12 A 5 pin female	CANopen/IO-Link

### Male M12 connectors for Bus-OUT



CANopen



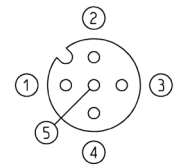
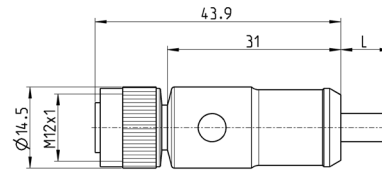
CS-LM05HC

Mod.	description	type of connector	connection	Fieldbus
CS-LM05HC	for metal wiring	straight	M12 A 5 pin male	CANopen

### Cable with M12 5 pin connector, straight female for Bus-IN



CANopen

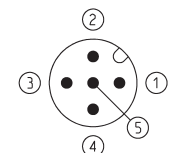
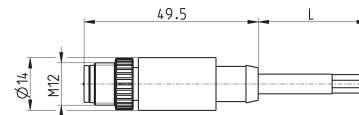


Mod.	description	type of connector	connection	cable length (m)
CS-LF05HB-D200	moulded cable	straight	M12, 5 pin female	2
CS-LF05HB-D500	moulded cable	straight	M12, 5 pin female	5

### Straight cable with M12 male connector for BUS OUT



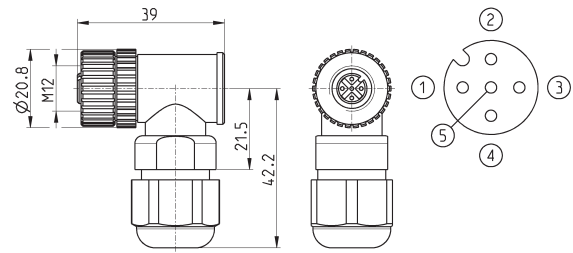
CANopen



Mod.	description	type of connector	connection	cable length (m)
CS-LM05HC-D200	moulded cable	straight	M12, 5 pin male	2
CS-LM05HC-D500	moulded cable	straight	M12, 5 pin male	5

### M12 Male connector, 90°, for Bus-IN

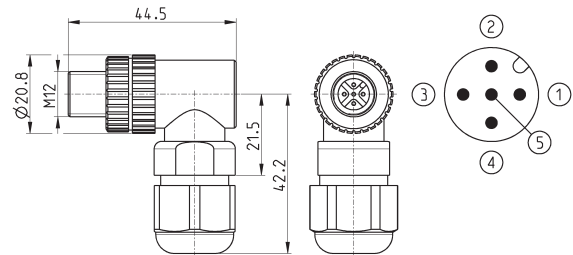
CANopen



Mod.	description	type of connector	connection	cable length (m)
CS-LR05HC	for wiring	90°	M12 A 4 pin female - Pin 5 is not connected	-

### M12 Male connector, 90°, for Bus-OUT

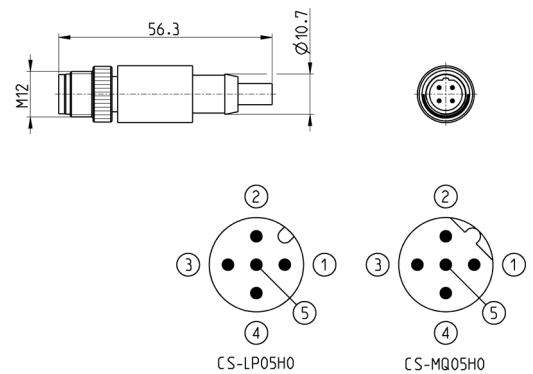
CANopen



Mod.	description	type of connector	connection	cable length (m)
CS-LS05HC	for wiring	90°	M12 A 4 pin male - Pin 5 is not connected	-

### Termination resistor with M12 male connector

CANopen

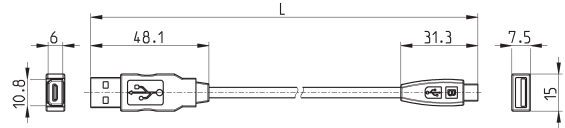


Mod.	description	type of connector	connection	Fieldbus
CS-LP05H0	moulded termination resistor	straight	M12 A 5 pin male - Pin 5 is not connected	CANopen

**USB to Micro USB cable Mod. G11W-G12W-2**



For the hardware configuration of the Camozzi products

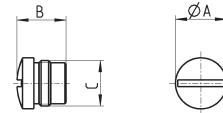


Mod.	description	connections	material for outer sheath	cable length "L" (m)
G11W-G12W-2	black shielded cable 28 AWG	standard USB to Micro USB	PVC	2

**M8 and M12 connector cover caps**



For digital and analog input/output modules and subnet



Mod.	A	B	C [ Connection ]
CS-DFTP	10	11	M8
CS-LFTP	13,5	13	M12