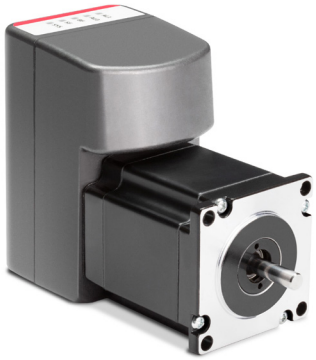
INTEGRATED FIELD-ORIENTED CONTROL DRIVE
SERIES DRVI

News

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) in different modes (position, speed, torque)
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 closedloop 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.

Products designed for industrial applications. General terms and conditions for sale are available on www.camozzi.com
This document contains a description of the products offered by Camozzi Automation at time of publication.
For more complete and up to date information about the Camozzi Automation product range, please refer to our online catalogue at https://shop.camozzi.com

General Data

	DRVI-23ST012-..	DRVI-24ST022-..	DRVI-24EC125-..
Motor type	Stepper	Stepper	Brushless DC
Flange size	NEMA 23	NEMA 24	NEMA 24
Power supply	24 - 48 VDC	24 - 48 VDC	24 - 48 VDC (nominal 48 V)
Logic supply	24 VDC		
GPIO (General-purpose input/ output)	2 digital inputs, for sensors (homing and extra-stroke) 2 general digital inputs 1 general digital output		
IP protection class	IP65, except motor shaft (caps must be fitted to unused connectors to ensure IP protection)		
Control loop	Closed loop by field-oriented control (FOC)		
Operation mode	Position Speed Torque (available only for brushless version DRVI-24EC)		
Communication protocol	Profinet CANopen EtherCAT EtherNet/IP		
Additional function	STO (Safe Torque Off), PLd, SIL 2, EN 61800-5-2		
Rated speed [rpm]	-	-	3000
Max speed [rpm]	3000	3000	3000
Rated torque [Nm]	-	-	0,5
Peak torque [Nm]	-	-	1,5
Torque at 0 rpm at 24VDC [Nm]	1,2	2,2	-
Torque constant Kt [Nm/A]	-	-	0,105
Rated power [W]	-	-	125
Rotor inertia [kg cm²]	0,38	0,78	0,91
Permissible radial load at the end of the shaft [N]	50N	60N	60N
Weight [kg]	1,1	1,6	1,1
Weight with Brake [kg]	1,85	2,35	1,85
Encoder type	Absolute single turn		
Recommended motor inertia ratio	<1:10		
Current Consumption [A]	3,5 A		
Current Consumption, logic [A]	<0,07A		
Current Consumption with Brake [A]	0,1A		
General digital Input IN1, IN2	Isolated, compliant with IEC 61131-2 type 3		
Sensor digital input Homing, External	Isolated input, differential, 24V		
General digital output	Protected isolated input, maximum 400mA <0,2		
Maximum auxiliary current 24VDC [A]	<0,13 A		
Protection	I2T, overvoltage, overcurrent, overtemperature		
Operating temperature [°C] (no icing)	-20°C / + 50°C for stepper version (DRVI-23ST.., DRVI-24ST..) must be considered a derating on nominal torque, over 30°C		
Humidity [%] (no condensing)	15% - 90%		
Installation max altitude [m]	1000		
Vibration resistance	IEC 60068-2-6, IEC 60068-2-64		
Shock resistance	IEC 60068-2-27		
Brake resistance	Not present		

Brake option	
Holding torque	1,5 Nm
Opening time	<=40 ms
Closing time	<=60 ms
Max single switching energy	115J
Service life, operating energy	23000J

Communication protocol data

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

Products designed for industrial applications. General terms and conditions for sale are available on www.camozzi.com
This document contains a description of the products offered by Camozzi Automation at time of publication.
For more complete and up to date information about the Camozzi Automation product range, please refer to our online catalogue at https://shop.camozzi.com

Coding Example

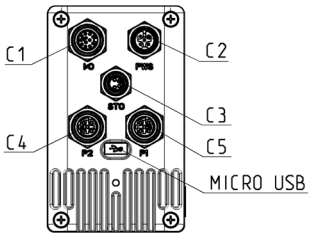
DRVI	-	23	ST	012	-	0	E	-	PN	SF

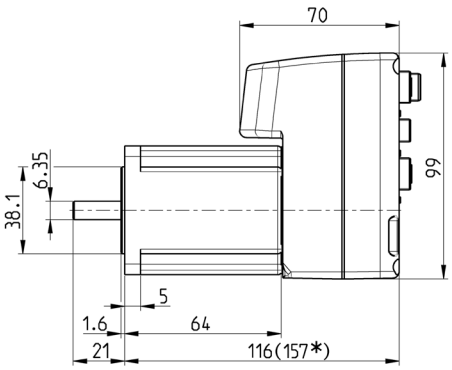
DRVI	SERIES
23	MOTOR FLANGE 23 = Nema 23 24 = Nema 24
ST	MOTOR TYPE ST = Stepper EC = Brushless DC
012	MOTOR TORQUE 012 = 1,2 Nm (Nema 23) 022 = 2,2 Nm (Nema 24) 125 = 125 W (Only for EC)
0	MOTOR BRAKE 0 = Without brake B = With brake
E	MOTOR FEEDBACK E = Absolute single turn encoder
PN	COMMUNICATION PROTOCOL PN = Profinet CO = CanOpen EC = EtherCAT EI = EtherNet/IP
SF	SAFETY FUNCTION = Standard SF = Safe torque off (PLd, SIL 2, EN 61800-5-2)

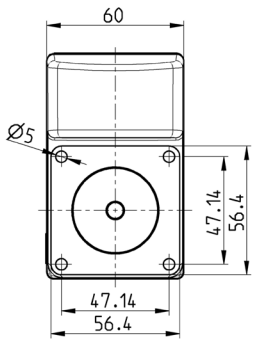
Products designed for industrial applications. General terms and conditions for sale are available on www.camozzi.com
This document contains a description of the products offered by Camozzi Automation at time of publication.
For more complete and up to date information about the Camozzi Automation product range, please refer to our online catalogue at https://shop.camozzi.com

Vector drive - Nema 23 stepper motor





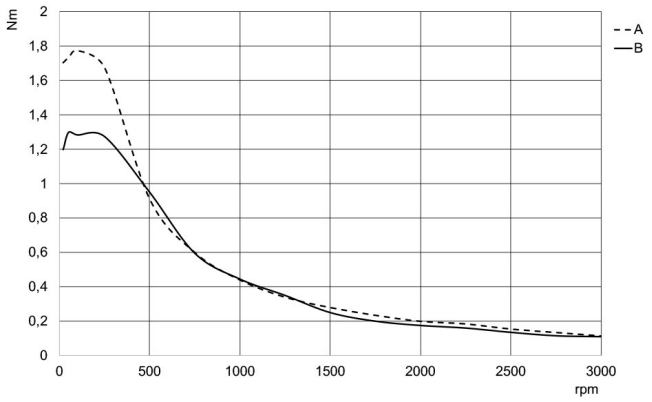




*** brake version**

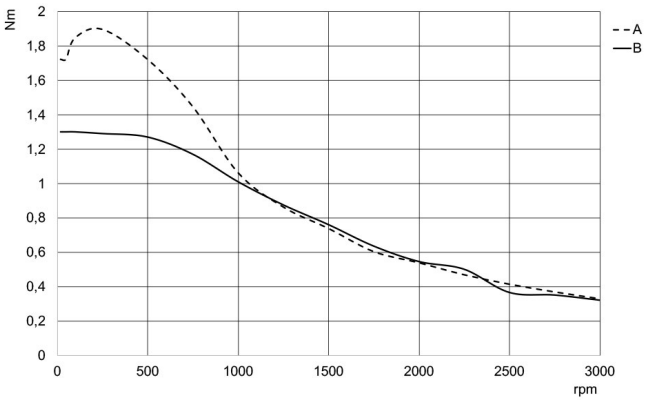
Mod.	C1	C2	C3	C4	C5
	Inputs/Outputs	Power supply	STO	Fieldbus interface	Fieldbus interface
DRVI-23ST012-...-PN	M12 12P Female A-coded	M12 5P Male A-coded	-	M12 4P Female D-coded	M12 4P Female D-coded
DRVI-23ST012-...-CO	M12 12P Female A-coded	M12 5P Male A-coded	-	M12 5P Female A-coded	M12 5P Male A-coded
DRVI-23ST012-...-EC	M12 12P Female A-coded	M12 5P Male A-coded	-	M12 4P Female D-coded	M12 4P Female D-coded
DRVI-23ST012-...-EI	M12 12P Female A-coded	M12 5P Male A-coded	-	M12 4P Female D-coded	M12 4P Female D-coded
DRVI-23ST012-...-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-...-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-...-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-...-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 (20°C)



A = Peak torque
B = Nominal torque

Torque curve at 48 VDC (20°C)

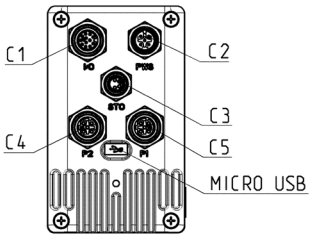


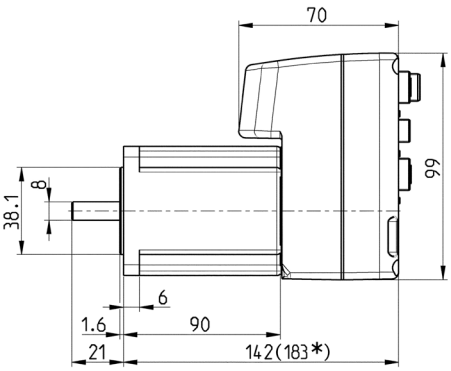
A = Peak torque
B = Nominal torque

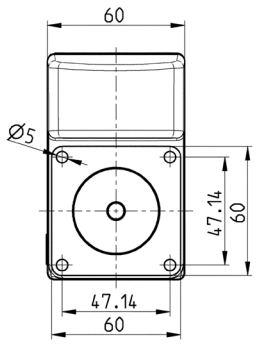
Products designed for industrial applications. General terms and conditions for sale are available on www.camozzi.com
This document contains a description of the products offered by Camozzi Automation at time of publication.
For more complete and up to date information about the Camozzi Automation product range, please refer to our online catalogue at https://shop.camozzi.com

Vector drive - Nema 24 stepper motor





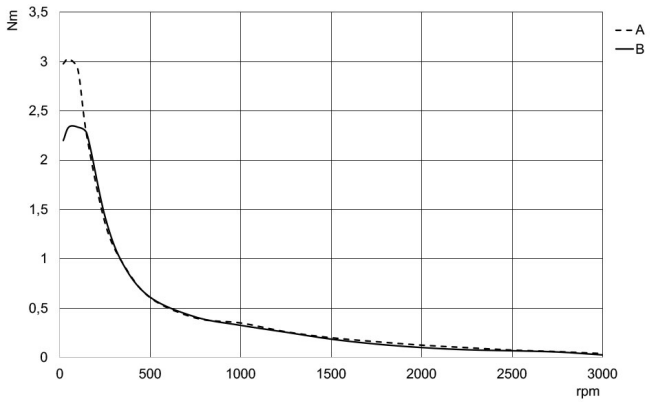




*** brake version**

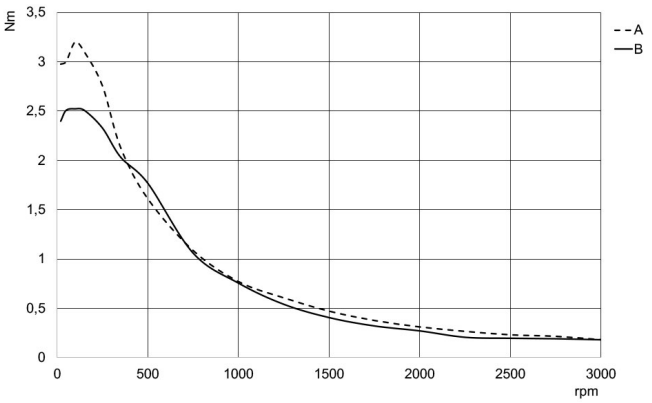
Mod.	C1	C2	C3	C4	C5
	Inputs/Outputs	Power supply	STO	Fieldbus interface	Fieldbus interface
DRVI-24ST022-...-PN	M12 12P Female A-coded	M12 5P Male A-coded	-	M12 4P Female D-coded	M12 4P Female D-coded
DRVI-24ST022-...-CO	M12 12P Female A-coded	M12 5P Male A-coded	-	M12 5P Female A-coded	M12 5P Male A-coded
DRVI-24ST022-...-EC	M12 12P Female A-coded	M12 5P Male A-coded	-	M12 4P Female D-coded	M12 4P Female D-coded
DRVI-24ST022-...-EI	M12 12P Female A-coded	M12 5P Male A-coded	-	M12 4P Female D-coded	M12 4P Female D-coded
DRVI-24ST022-...-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-...-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-...-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-...-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 (20°C)



A = Peak torque
B = Nominal torque

Torque curve at 48 VDC (20°C)

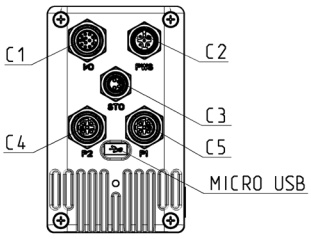


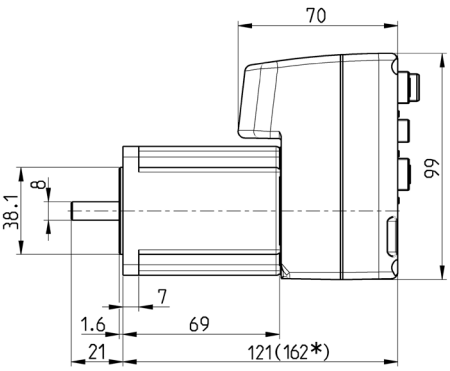
A = Peak torque
B = Nominal torque

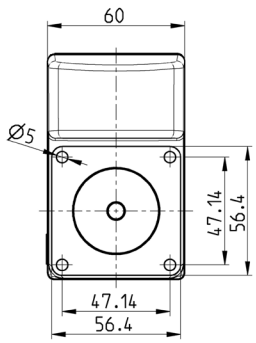
Products designed for industrial applications. General terms and conditions for sale are available on www.camozzi.com
This document contains a description of the products offered by Camozzi Automation at time of publication.
For more complete and up to date information about the Camozzi Automation product range, please refer to our online catalogue at https://shop.camozzi.com

Vector drive - Nema 24 BLDC motor





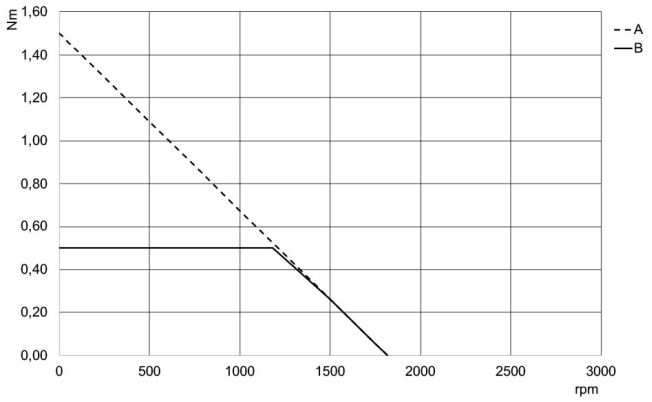




*** brake version**

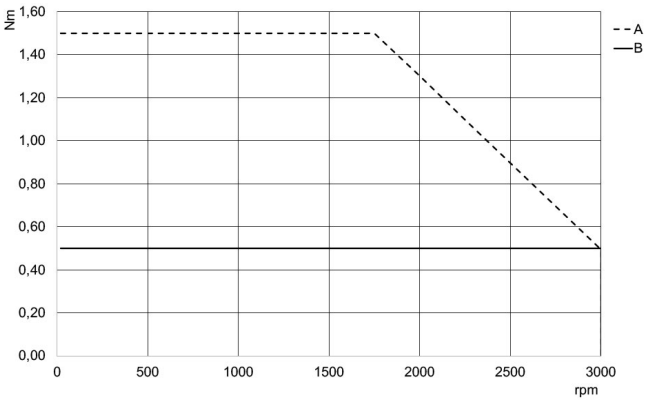
Mod.	C1	C2	C3	C4	C5
	Inputs/Outputs	Power supply	STO	Fieldbus interface	Fieldbus interface
DRVI-24EC125-...-PN	M12 12P Female A-coded	M12 5P Male A-coded	-	M12 4P Female D-coded	M12 4P Female D-coded
DRVI-24EC125-...-CO	M12 12P Female A-coded	M12 5P Male A-coded	-	M12 5P Female A-coded	M12 5P Male A-coded
DRVI-24EC125-...-EC	M12 12P Female A-coded	M12 5P Male A-coded	-	M12 4P Female D-coded	M12 4P Female D-coded
DRVI-24EC125-...-EI	M12 12P Female A-coded	M12 5P Male A-coded	-	M12 4P Female D-coded	M12 4P Female D-coded
DRVI-24EC125-...-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-...-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-...-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-...-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 (20°C)



A = Peak torque
B = Nominal torque

Torque curve at 48 VDC (20°C)

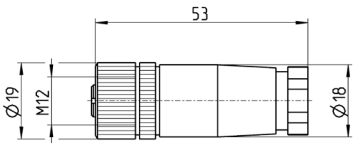


A = Peak torque
B = Nominal torque

Products designed for industrial applications. General terms and conditions for sale are available on www.camozzi.com
This document contains a description of the products offered by Camozzi Automation at time of publication.
For more complete and up to date information about the Camozzi Automation product range, please refer to our online catalogue at https://shop.camozzi.com

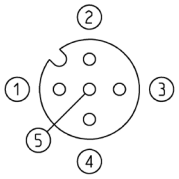
Connector M12, 5 pin, female, straight







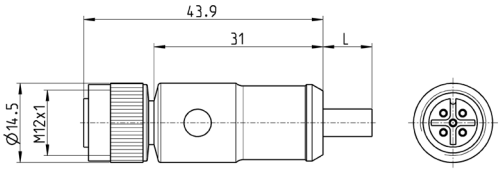
Connector for power supplies (PWR)



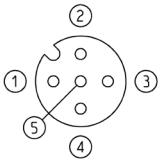
Mod.	Description	Type of connector	Connection	
CS-LF04HB	For wiring	Straight	M12 A 4 pin female -	Pin 5 is not connected

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





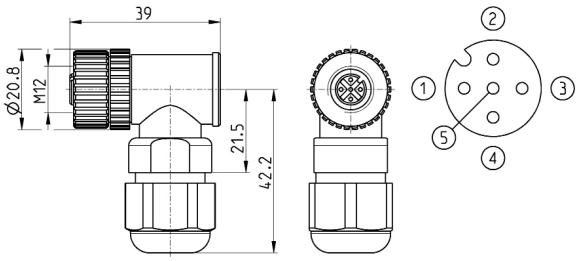
Cable for power supplies (PWR)



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

Connector M12, 5 pin, female, angular



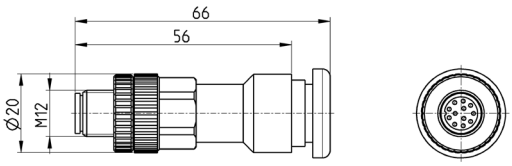


Connector for power supplies (PWR)

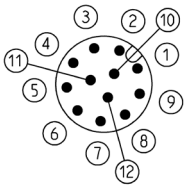
Mod.	Description	Type of connector	Connection
CS-LR05HC	For wiring	90°	M12, 5 pin female

Connector M12, 12 pin, male, straight





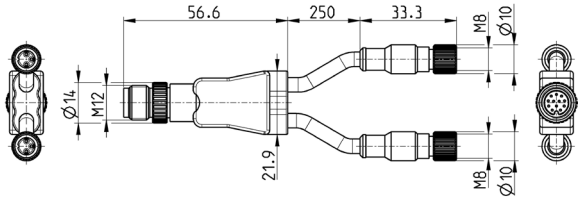
General Purpose Input/Output (GPIO)



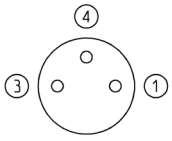
Mod.	Description	Type of connector	Connection
CS-LM12HC	For wiring	Straight	M12 12 pin male

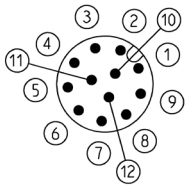
Y-cable with M12 / 12 pin and 2x M8 / 6 pin connectors





General Purpose Input/Output (GPIO)

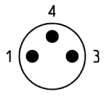


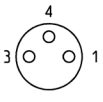


Mod.	Description	Type of connector	Connection	Cable length [m]
CS-LO12HC-D025	For wiring	Straight	M12 12 pin male + 2x M8 PIN female	0,25

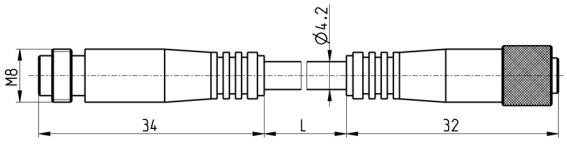
Extension with M8 connector, 3 pin male/female (Non shielded)







General Purpose Input/Output (GPIO)

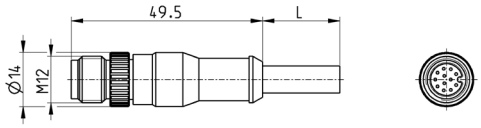


Mod.	Description	Type of connector	Connection	L (cable length) [m]
CS-DW03HB-C250	Moulded cable	Straight	M8 3 pin male / female	2,5
CS-DW03HB-C500	Moulded cable	Straight	M8 3 pin male / female	5

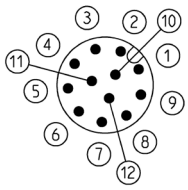
Products designed for industrial applications. General terms and conditions for sale are available on www.camozzi.com
This document contains a description of the products offered by Camozzi Automation at time of publication.
For more complete and up to date information about the Camozzi Automation product range, please refer to our online catalogue at https://shop.camozzi.com

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





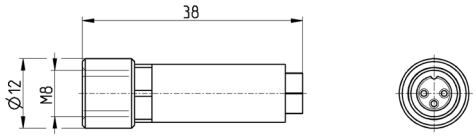
General Purpose Input/Output (GPIO)



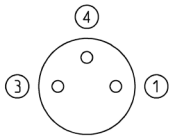
Mod.	Description	Type of connector	Connection	Cable length [m]
CS-LM12HC-D500	Moulded cable	Straight	M12, 12 pin male	5

Connector M8, 3 pin, female, straight





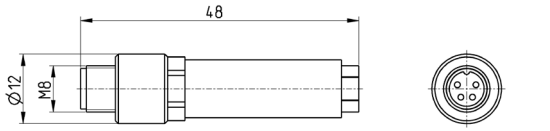
General Purpose Input/Output (GPIO)



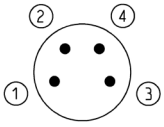
Mod.	Description	Type of connector	Connection
CS-DF03HB	For wiring	Straight	M8 3 pin female

Connector M8, 4 pin, male, straight





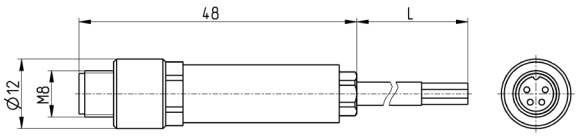
Safe Torque Off (STO)



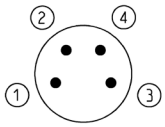
Mod.	Description	Type of connector	Connection
CS-DM04HB	For wiring	Straight	M8 4 pin male

Cable with M8, 4 pin, connector, male, straight





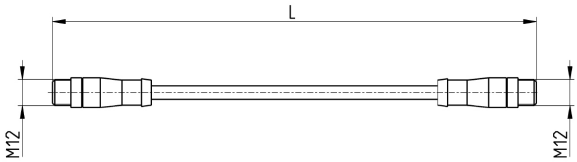
Safe Torque Off (STO)



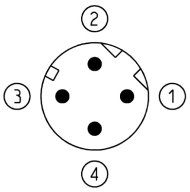
Mod.	Description	Type of connector	Connection	Cable length [m]
CS-LM04HB-D500	Moulded cable	Straight	M8, 4 pin male	5

Cable with straight connectors





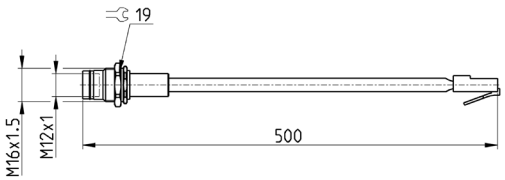
Profinet, EtherCAT, EtherNet/IP



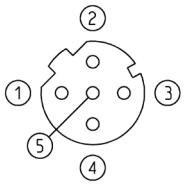
Mod.	Description	Type of connector	Connection	Cable length [m]
CS-SB04HB-D100	Moulded cable	Straight	2x M12 D 4 pin male	1
CS-SB04HB-D500	Moulded cable	Straight	2x M12 D 4 pin male	5
CS-SB04HB-DA00	Moulded cable	Straight	2x M12 D 4 pin male	10
CS-SB04HB-DD00	Moulded cable	Straight	2x M12 D 4 pin male	15
CS-SB04HB-DG00	Moulded cable	Straight	2x M12 D 4 pin male	20
CS-SB04HB-DJ00	Moulded cable	Straight	2x M12 D 4 pin male	25

Adapter and panel mount for Ethernet networks RJ45 to M12 D





Profinet, EtherCAT, EtherNet/IP

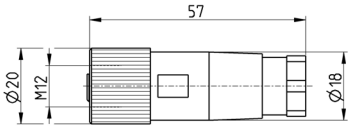


Mod.	Description	Type of connector	Connection	Cable length [m]
CS-SE04HB-F050	Moulded cable	Straight	RJ45 male, M12 D 4 pin female - Pin 5 is not connected	0,5

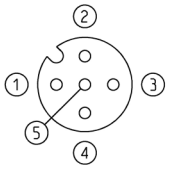
Products designed for industrial applications. General terms and conditions for sale are available on www.camozzi.com
This document contains a description of the products offered by Camozzi Automation at time of publication.
For more complete and up to date information about the Camozzi Automation product range, please refer to our online catalogue at https://shop.camozzi.com

Connector M12, 5 pin, female, straight









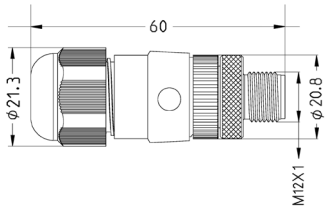
CS-LF05HC

CANopen bus IN

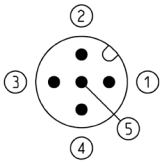
Mod.	Description	Type of connector	Connection
CS-LF05HC	For wiring	Straight	M12 A 4 pin female - Pin 5 is not connected

Connector M12, 5 pin, male, straight









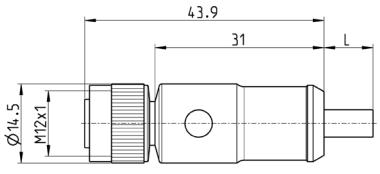
CS-LM05HC

CANopen bus OUT

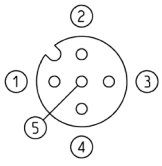
Mod.	Description	Type of connector	Connection	Fieldbus
CS-LM05HC	For metal wiring	Straight	M12 A 5 pin male	CANopen

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









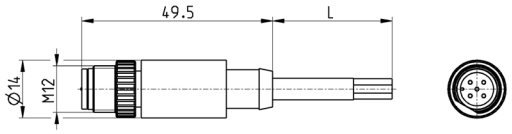
CANopen bus IN

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

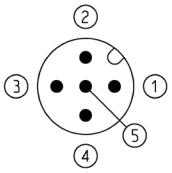
Products designed for industrial applications. General terms and conditions for sale are available on www.camozzi.com
This document contains a description of the products offered by Camozzi Automation at time of publication.
For more complete and up to date information about the Camozzi Automation product range, please refer to our online catalogue at https://shop.camozzi.com

Connector M12, 5 pin, male, straight





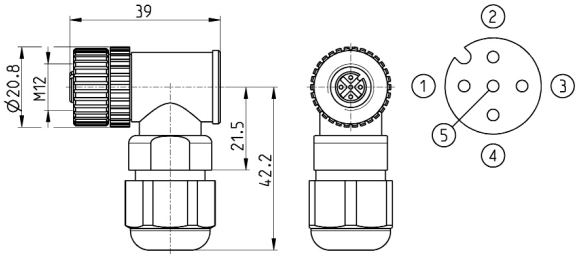
CANopen bus OUT



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

Connector M12, 5 pin, female, angular



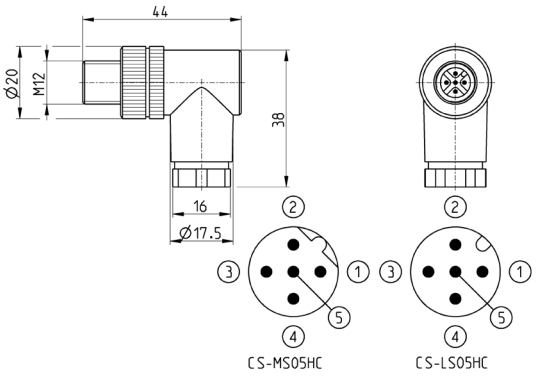


CANopen bus IN

Mod.	Description	Type of connector	Connection
CS-LR05HC	For wiring	90°	M12, 5 pin female

Connector M12, 5 pin, male, angular





CANopen bus OUT

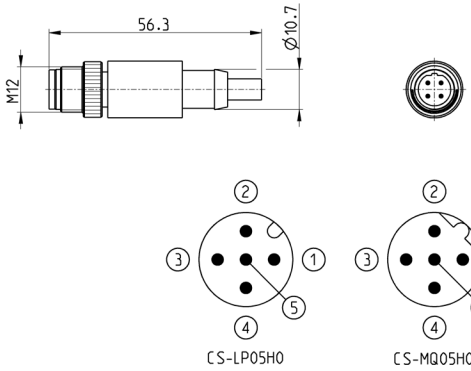
Mod.	Description	Type of connector	Connection
CS-LS05HC	For wiring	90°	M12 A 4 pin male - Pin 5 is not connected

Products designed for industrial applications. General terms and conditions for sale are available on www.camozzi.com
This document contains a description of the products offered by Camozzi Automation at time of publication.
For more complete and up to date information about the Camozzi Automation product range, please refer to our online catalogue at https://shop.camozzi.com

M12 male terminating resistor



CANopen

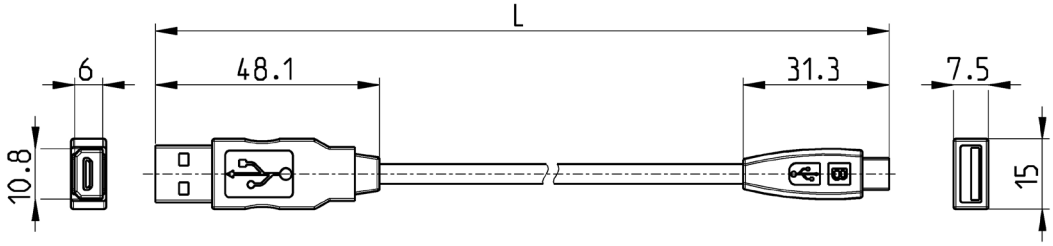


Mod.	Description	Type of connector	Connection	Fieldbus
CS-LP05H0	Moulded terminating resistor	Straight	M12 A 5 pin male - Pin 5 is not connected	CANopen

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



For the hardware configuration of the Camozzi products

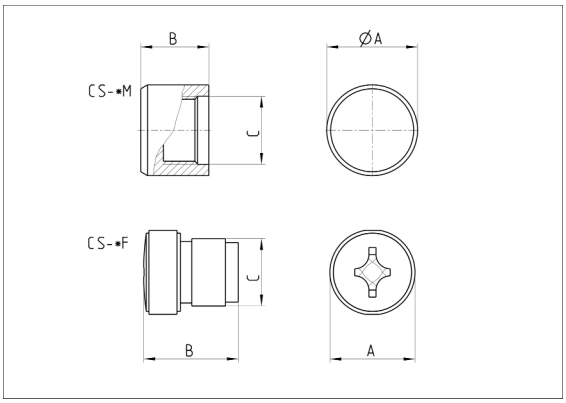


Mod.	Description	Connections	Material for outer sheath	Cable length "L" (m)
G11W-G12W-2	Black shielded cable 28 AWG	Standard USB to Micro USB	PVC	2

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	15	16,8	M12
CS-LMPT	15,8	12	M12

Products designed for industrial applications. General terms and conditions for sale are available on www.camozzi.com
This document contains a description of the products offered by Camozzi Automation at time of publication.
For more complete and up to date information about the Camozzi Automation product range, please refer to our online catalogue at https://shop.camozzi.com