JVL A/S | Bregnerødvej 127 | DK-3460 Birkerød | Denmark | Tel.(+45) 4582 4440 | www.jvl.dk | sales@jvl.dk

MIS231Q1EPH2S6

Int.Step 12-72VDC, Profinet, EncC-L, STO

ServoStep MIS is a series of integrated stepper motors with servo control (closed-loop) and up to 3000 RPM.
It consists of NEMA 17..23..34..43 size motors with holding torques from 0.18 Nm up to 25 Nm.
All motors are programmable and have 8 I/O points (each can be DI or DO or AI).

Options include:
- incremental (semi-absolute) encoder*). absolute multiturn encoder
- brake module*)
- radial or axial*) connectors
- CANopen
- Ethernet interface w/built-in switch for easy daisy-chaining and all protocols (Profinet. EtherNet/IP. EtherCAT. Sercos. ModbusTCP/UDP. Powerlink).
- Wireless versions are also possible: WLAN or BlueTooth.
- Special shaft versions include double shaft and hollow shaft. contact JVL to learn which combinations are possible.
- Higher IP versions are also available. *) Depending of other options

General information

Description	Int.Step 12-72VDC, Profinet, EncC-L, STO, 4xM12. 2x4pF:Profinet 17pF:8xDIO/AI +RS422+RS485, High Resolution: 409.600 step/rev. ±0.01 RPM, Programmable (incl. current, position & velocity), with STO, Closed-Loop Semi-Abs. Encoder 4096 CPR, Ø6.35x20 mm Round Shaft: IP42Motor: IP42, 56.4x103 mm Holding Torque: 0.97 NmMax. 177.00 WAxial Connector12-72 VDC		
Manufacture	JVL	**Motor type**	Integrated Stepper - Rotating
Motor resolution	409600	**Encoder type**	H2 Incremental/abs_singleturn
Speed [Rpm]	3000.00	**Power Peak [W]**	177.00
Flange size	NEMA 23 - 57x57mm	**Shaft size - Front [mm]**	6.35 mm
Running torque [Nm]	0.97	**Rated Winding current [A]**	6.0
Holding torque [Nm]	0.97	**Connectivity: Without module**	Profinet
Integrated PLC	Yes	**PLC no. of DI/DO/AI**	8
Closed loop	Yes	**STO connector**	Yes
Integrated gear	No	**Gear ratio**	
Brake	External brake option	**Protection House/Shaft**	
Shaft Double	No	**Main supply [V]**	12-72

MIS231Q1EPH2S6 Int.Step 12-72VDC, Profinet, EncC-L, STO

General information

Main supply UL [V]	12-60	**Voltage type - Main**	DC
Control voltage (CVI/O+) [VDC]	7-28	**Control Voltage for UL recognized**	7–30 VDC 150 mA + max 500 mA for user outputs
Weight net [kg]	1.02	**MTBF 100% [Year]**	13
Weight gross [kg]	1.14	**MTBF 30% [Year]**	15
Software	MacTalk		
CE Marked	Yes		
CE			
Approval - ROHS-3	Yes		
RoHS 3			
Approval UL	Yes. Recognized	**UL Installation**	Read more in usermanual about UL precautions
c UL us E516423			

Ambient Temperature range [°C]:		**Max. Amb. Temperature range - Torque derating:**	
Maximum Installation Altitude [m]:		**- Power Derating every 1000m over 1000m [%]:**	

Motion Information:			
Velocity Precision [+/-ppm]		**Velocity Resolution [Rpm]**	
Acceleration / Deceleration Range [Rpm/s]		**Acceleration / Deceleration Range [Rpm/s]**	
Electronic Gearing Ratio [Range / Resolution]		**Country Of Origin**	DK
Tariff no	85015100	**Tariff no US**	

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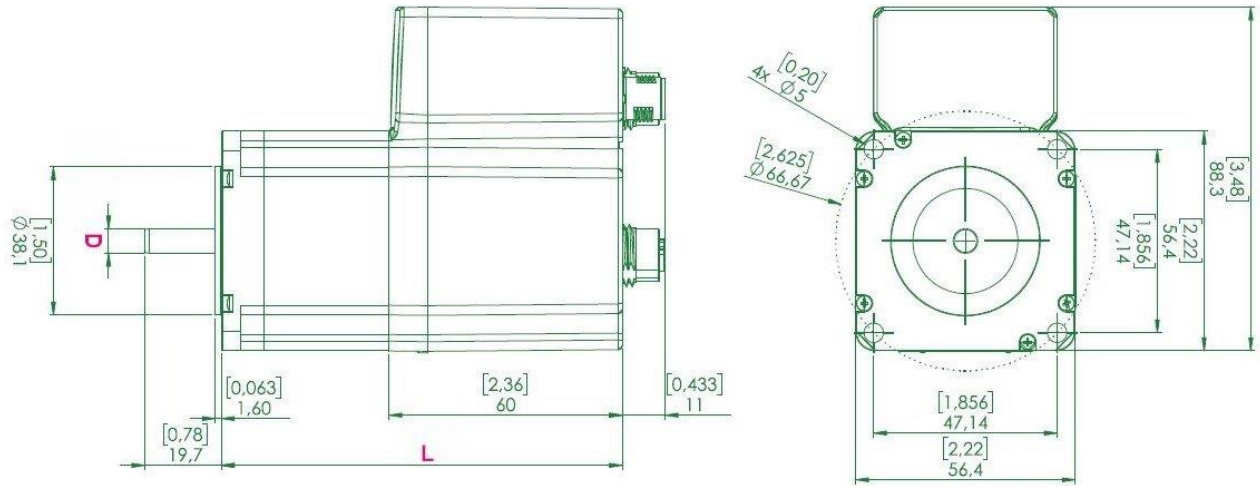
Mechanical information

Paint type

Motor Type	Length (L) ±2.0 [0.0787]	Shaft dia. (D) +0 / -0.013mm[0.000512]
MIS231Q... MIS232Q... MIS234Q...	103 [4.06] 124 [4.88] 161 [6.34]	6.35 [0.25] 6.35 [0.25] 10.0 [0.3937]
MIS231R... MIS232R...	103 [4.06] 124 [4.88]	6.35 [0.25] 10.0 [0.3937]

[ ] = Inches

This drawing covers only motor type MIS23xQ and MIS23xR with radial connectors



Motor length [mm]	103	**Motor width [mm]**	56.4
Motor height [mm]	88.3		
Protection house	IP42	**Protection shaft**	IP42
		Flange Rear	No
Flange Type Front		**Flange Type Rear**	
Motor diameter center front [mm]	38.1	**Motor diameter center rear [mm]**	
Bolt circle diameter front [mm]	66.6	**Bolt circle diameter front [mm]**	
Mounting holes front [mm]	5 mm	**Mounting holes rear [mm]**	
Flange Thickness [mm]		**Flange material**	Aluminium
		Shaft Double	No
Shaft Type Output	Round	**Shaft Type Rear**	
Shaft size - Front [mm]	6.35 mm	**Shaft size - Rear**	-
Shaft length Front [mm]	20.0	**Shaft length Rear [mm]**	
Shaft material	Stainless steel AISI303	**Shaft Key included**	Key NOT included
Shaft Key Dimension	-		
Integrated gear	No	**Gear ratio**	

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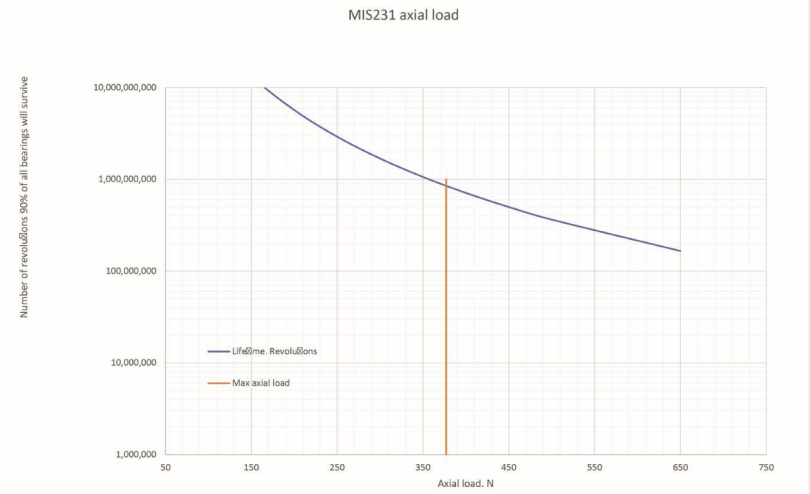
Mechanical information

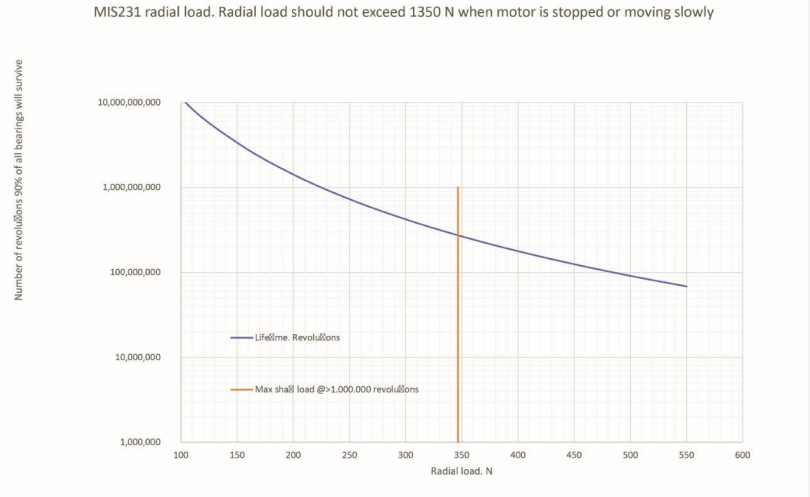
Gear efficiency [%]	< -	**Gear backlash [ArcMin]**	-
Brake	External brake option	**Brake - Go ON time [ms]**	-
Brake Holding torque [Nm]	-	**Brake - Go OFF time [ms]**	-
Rotor inertia [kgcm^2]	0.3	**Max inertia factor**	40
Precision Motor - Absolute [Deg -/+]	0.35	**Precision Motor - Max Load [Deg -/+]**	
Precision Motor - Repeatabillity [Deg -/+]	0.15	**Step angle [°/full step]**	1.8°
CAD 2D [PDF]	Download	**CAD 3D [STEP]**	Download
CAD 2D [DWG]	No	**CAD 3D [DWG]**	No
CAD 3D [EASM]	No	**CAD 3D [IGES]**	No
Datasheet - pdf		**CAD file page**	Link
User Manual	Download	**WEB page**	Link
Approval UL	Yes. Recognized	**UL Installation**	Read more in usermanual about UL precautions
STO connector	Yes	**Approval - ATEX**	No
Approval TÜV - STO	Yes	**Oil resistant**	
Temperature ambient [°C]	0...40 °C and 0...70 °C with derating of performance	**Temperature storage**	-40...70 °C
Humidity working	5...93% non-condensing	**Vibration**	5-25 Hz: +/-1.6mm, 25-500Hz: 4G, 1.0 oct./min
Shock	15G, 30ms. 6 x 1000 cycles in +/-X, +/-Y, +/-Z	**Withstand Voltage**	500 VDC between earth and supply ground
EMC in general	EMC Directive DIR2014/30/EU	**EMC Emission**	EN61800-3 / EN61000-6-3 / EN61000-6-4 all 2. enviroment
EMC Immunity	En IEC 61800-3 / EN61000-6-1 all 2. enviroment	**Safety in general**	LVD DIR2014/35/EU / EL61800 - USA and Canada only MIS34x products are pending
Safety wo STO	EN60950-1	**Safety w STO**	EN60950-1 / EN61508-1/-2 SIL3 / ISO13849-1/-2 / ISO62061 / EN61800-5-1/-2
Inviromental	IEC 60068-2-27, Test Ea. Shock test	**Inviromental 2**	IEC 60068-2-6, Test Fc. Vibration test
Inviromental 3	IEC 60068-2-2, Test Bd. covers temperaturerise/dry heat	**Inviromental 4**	IEC 60068-2-78, Perm. moisture/Damp heat, steady state
REACH SVHC document	REACH-SVHC Statement	**Low voltage Directive**	LVD conformity with EU standard: EN IEC 62368-1:2020/A11:2020
No Dual Use	Read more here		
Duty Cycle		**Max Duty Cycle [%]**	
Dutycycle UL	Read more in usermanual about UL precautions		
Front bearing type	6000ZZ	**Rear bearing type**	6000ZZ
Axial Load Max: Typical Term	Axial load Max Typical is a run of 10.800.000 revolutions at indicated load	**Axial Load Max: Long Term**	Axial load Max Long is a run of 1.440.000.000 revolutions at indicated load
Axial Load Max: Typical [N] (Bearing)	377	**Axial Load Max: Long [N] (Bearing)**	314

MIS231Q1EPH2S6 Int.Step 12-72VDC, Profinet, EncC-L, STO

Mechanical information



Radial Load Max Typical Term:	Radial load Max Typical is a run of 10.800.000 revolutions at indicated load	**Radial Load Max Long Term:**	Radial load Max Long is a run of 1.440.000.000 revolutions at indicated load
Radial Load Max: Typical [N] (Bearing)	346	**Radial Load Max: Long [N] (Bearing)**	282



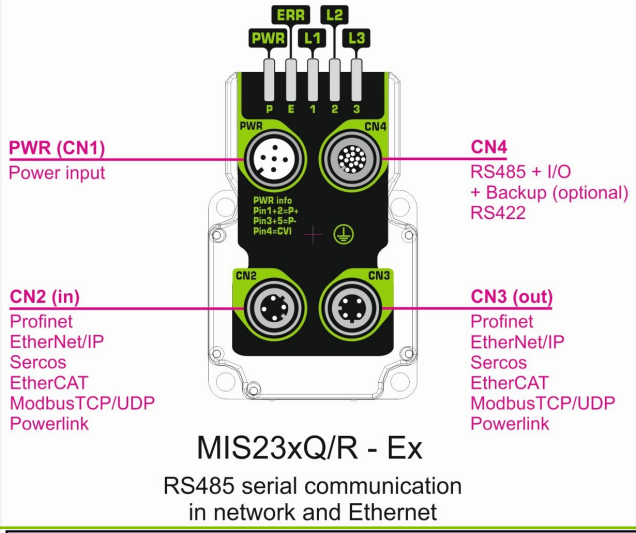
Radial load distance [mm]	10	**Axial play [mm]**	
Axial play force [N]		**Shaft Seal**	

MIS231Q1EPH2S6 Int.Step 12-72VDC, Profinet, EncC-L, STO

Connector information

Connector 1 label	PWR	**Connector 1**	M12 5-pin male A-coded
Connector 2 label	CN2	**Connector 2**	M12 4-pin female D-coded Ethernet
Connector 3 label	CN3	**Connector 3**	M12 4-pin female D-coded Ethernet
Connector 4 label	CN4	**Connector 4**	M12 17-pin female A-coded
Connector 1 RS485	No	**Connector 2 RS485**	No
Connector 3 RS485	No	**Connector 4 RS485**	Yes

Motor connectors



MIS23xQ/R - Ex

RS485 serial communication
in network and Ethernet

Picture CN1

"PWR" (CN1) - Power input. M12 - 5pin male connector

Signal name	Description	Pin no.	JVL Cable WI1000-M12F5TxxN	Isolation group
P+	Main supply +7-72VDC. Connect with pin 2 *	1	Brown	1
P+	Main supply +7-72VDC. Connect with pin 1 *	2	White	1
P-	Main supply ground. Connect with pin 5 *	3	Blue	1
CVI	Control and user output supply +7-30VDC. **DO NOT connect >30V to this terminal!**	4	Black	1
P-	Main supply ground. Connect with pin 3 *	5	Grey	1

* Note: P+ and P- are each available at 2 terminals. Make sure that both terminals are connected in order to split the supply current in 2 terminals and thereby avoid an overload of the connector.

Picture CN2

"CN2" - Ethernet In port connector - M12 - 4pin female connector "D" coded

Signal name	Description	Pin no.	JVL Cable WI1046-M12M4S05R	Isolation group (See note)
Tx0_P	Ethernet Transmit channel 0 - positive terminal	1	-	2
Rx0_P	Ethernet Receive channel 0 - positive terminal	2	-	2
Tx0_N	Ethernet Transmit channel 0 - negative terminal	3	-	2
Rx0_N	Ethernet Receive channel 0 - negative terminal	4	-	2

MIS231Q1EPH2S6 Int.Step 12-72VDC, Profinet, EncC-L, STO

Connector information

Picture CN3

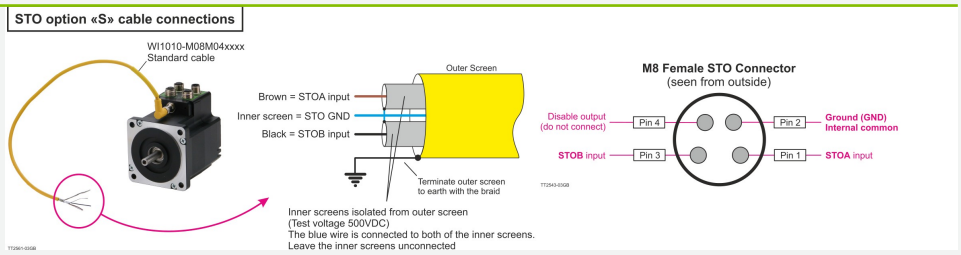
"CN3" - Ethernet Out port connector. M12 - 4 pin female connector "D" coded				
Signal name	**Description**	**Pin no.**	**JVL Cable WI1046-M12M4S05R**	**Isolation group (see note)**
Tx1_P	Ethernet Transmit channel 1 - positive terminal	1	-	3
Rx1_P	Ethernet Receive channel 1 - positive terminal	2	-	3
Tx1_N	Ethernet Transmit channel 1 - negative terminal	3	-	3
Rx1_N	Ethernet Receive channel 1 - negative terminal	4	-	3

Picture CN4

"CN4" - RS485 + I/O + Backup (option) connector - M12 - 17pin female connector				
Signal name	**Description**	**Pin no.**	**JVL Cable WI1009M12 M17TxxN**	**Isolation group (see note)**
IO1	I/O channel 1. Can be used as input or output	1	Brown	1
GND	Ground intended to be used together with the other signals in this connector	2	Blue	1
IO2	I/O channel 2. Can be used as input or output	3	White	1
IO3	I/O channel 3. Can be used as input or output	4	Green	1
RS422: B1-	RS422 I/O terminal B-	5	Pink	1
IO4	I/O channel 4. Can be used as input or output	6	Yellow	1
RS422: A1-	RS422 I/O terminal A-	7	Black	1
RS422: B1+	RS422 I/O terminal B+	8	Grey	1
CVO	Supply output. Connected internally to the **CVI** terminal in the PWR connector. **DO NOT connect >30V to this terminal!**	9	Red	1
RS422: A1+	RS422 I/O terminal A+	10	Violet	1
IO5	I/O channel 5. Can be used as input or output	11	Grey/pink	1
IO6	I/O channel 6. Can be used as input or output	12	Red/blue	1
IO7	I/O channel 7. Can be used as input or output	13	White/Green	1
IO8	I/O channel 8. Can be used as input or output	14	Brown/Green	1
RS485: B0-	RS485 interface. Leave open if unused	15	White/Yellow	1
EXTBACKUP	Only for motors with the -H3 or -H4 option (abs. multiturn encoder). This terminal can be connected to an external supply. **Connect to ground (GND) if not used.**	16	Yellow/brown	1
RS485: A0+	RS485 interface. Leave open if unused	17	White/grey	1
* Note: Isolation group indicate which terminals/circuits that a galvanic connected to each other. In other words group 1, 2, 3 and 4 are all fully independently isolated from each other. Group 1 correspond to the housing of the motor which may also be connected to earth via the DC or AC input supply.				

Connector STO M8 4-pin female A-coded

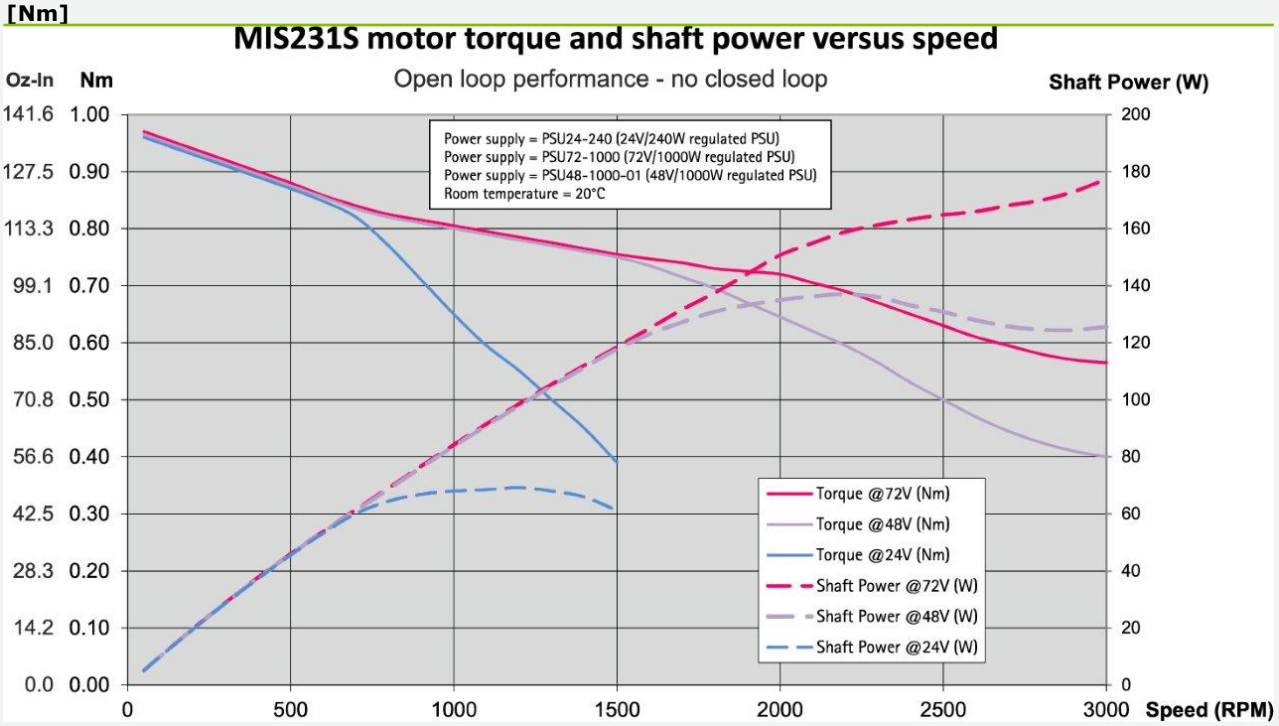
Picture STO Con



MIS231Q1EPH2S6 Int.Step 12-72VDC, Profinet, EncC-L, STO

Torque, force and Power information

Supply Volt 1 [V]		**Power Peak 1 [W]**	
Supply Volt 2 [V]	24	**Power Peak 2 [W]**	69.00
Supply Volt 3 [V]	48	**Power Peak 3 [W]**	137.00
Supply Volt 4 [V]	72	**Power Peak 4 [W]**	177.00
Holding torque [Nm]	0.97	**Running torque [Nm]**	0.97
Detent torque [Nm]			



MIS231Q1EPH2S6 Int.Step 12-72VDC, Profinet, EncC-L, STO

Electrical information

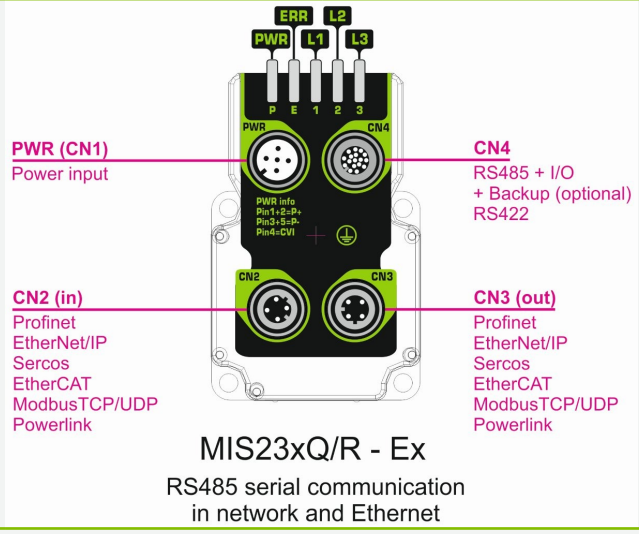
Main supply [V]	12-72	**Main supply Min-Max [V]**	7-90
Main supply UL [V]	12-60	**Main supply Max UL [V]**	7-60
Rated motor current [A]	5.2	**Control voltage (CVI/O+) [VDC]**	7-28
Control Voltage (CVI) Min-Max [VDC]	7-30	**Control Voltage for UL recognized**	7–30 VDC 150 mA + max 500 mA for user outputs
CVI current wo Ethernet and output (12/24VDC) [mA]	90/55	**Current Ethernet option (12/24VDC) [mA]**	120/60
Current brake option [mA]	-	**Current for 1 Dig. output - max [mA]**	350
Max current CVI [A]			
Encoder type	H2 Incremental/abs_singleturn	**Encoder Resolution (H2)**	H2 - 4096 Singleturn AbsEnc - Semi multiturn
Encoder Resolution (H3)	-	**Encoder revolutions**	+/-5242
PLC no. of DI/DO/AI	8	**Analogue voltage**	0-5VDC 12bit
Dig. Input impedans	30 Kohm	**Counter frequency max**	12MHz
Standard used		**Standard used 2**	
Resistance [Ohm]		**Induction [mH]**	

MIS231Q1EPH2S6 Int.Step 12-72VDC, Profinet, EncC-L, STO

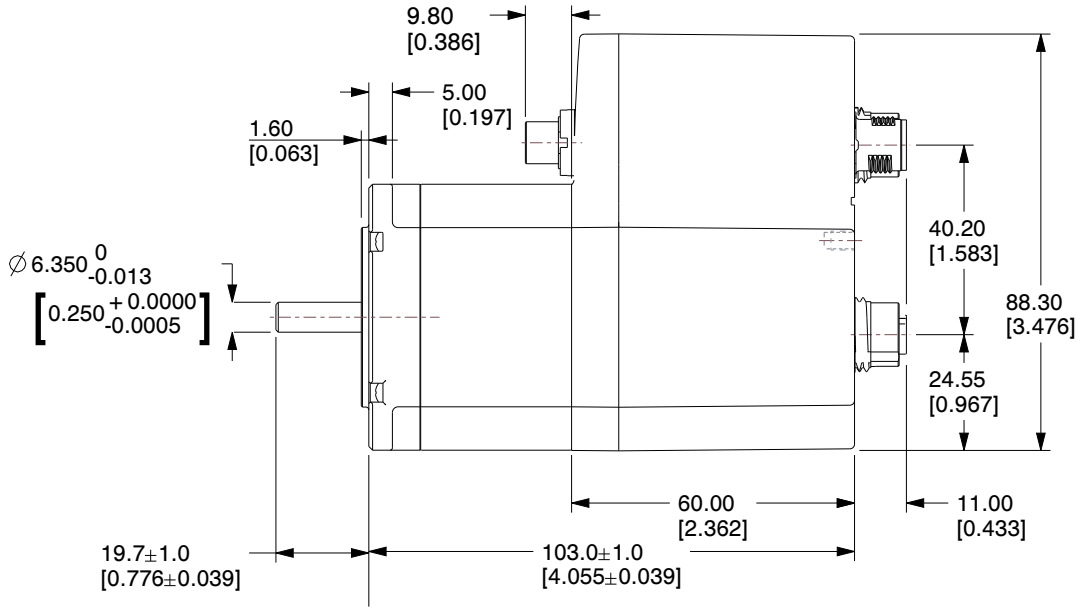
Communication information

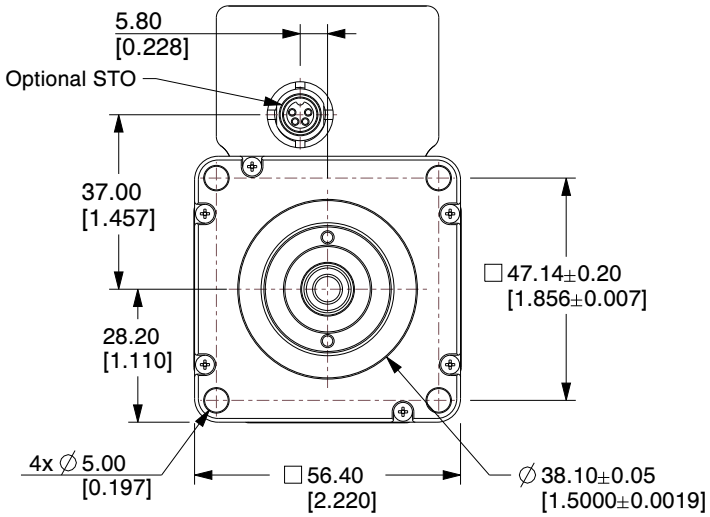
Software	MacTalk	**Connector 2 RS485**	No
Connectivity: Without module	Profinet	**Connector 3 RS485**	No
		Connector 4 RS485	Yes

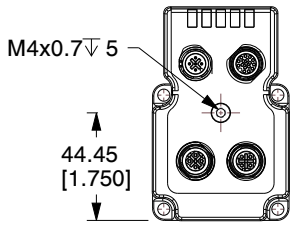
Motor connectors



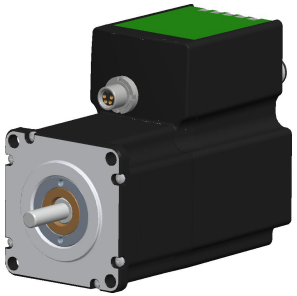
e-PLC Files	**Ethernet, PLC demo files**







REAR VIEW



NOTES:
1. Operation Modes : Passive, Position, Gear, Velocity.
2. Tolerance for torque and power is ±10%.
3. Shaft - AISI 303 Stainless steel.
4. Front Bearing: 3202-2RS Double row angular contact.
5. Encoder Type: Internal, magnetic, absolute 1 rev. Closed loop ready. Resolution per rev.: 4096 counts / 1024 lines (quadrature output).

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Denmark
JVL www.jvl.dk

PART NUMBER:

MIS231Q1EPH2S6

PART DESCRIPTION:

Integrated Stepper Motor

	A4	SCALE	NTS
		UNIT	MM [Inch]