

Motor units MTR-DCI, intelligent servo motors



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Key features



General information

The motor unit MTR-DCI is an innovative motor with integrated power electronics for positioning tasks.

Four components in one housing

Integrated in the MTR-DCI are the motor, gear unit, controller and power electronics. This means that there is no need for a control cabinet or extensive cabling.

Reliable

The integrated power electronics and controller removes the need for motor cables and improves the electromagnetic compatibility. Additional monitoring functions are integrated.

Uncomplicated

The complete commissioning process can be performed directly on the MTR-DCI via the optional LCD display or on a PC via the user-friendly menus in the FCT (Festo Configuration Tool). No matter which approach is used, all parameters are continuously controlled.

At a glance

- Compact design
- Smooth profile prevents the ingress of dirt
- DC motor with planetary gear unit and encoder
- Gear unit ratio: 7:1; 14:1, 22:1
- Protection class IP54

Positioning functionality

- 16 traversing records (including homing)
- Constant acceleration and braking
- Positioning control

Protective functions

- Temperature monitoring
- Current monitoring
- Voltage failure detection
- Following error monitoring
- Software end-position detection

Easy actuation via

- I/O interface
- Profibus
- CANopen
- DeviceNet

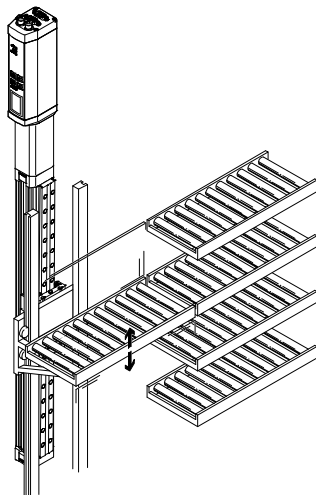


- 1 Control panel with integrated display (optional)
- 2 Input for reference limit switches
- 3 RS232 interface
- 4 Operator interface: I/O interface
- 5 Power supply
- 6 Gear unit

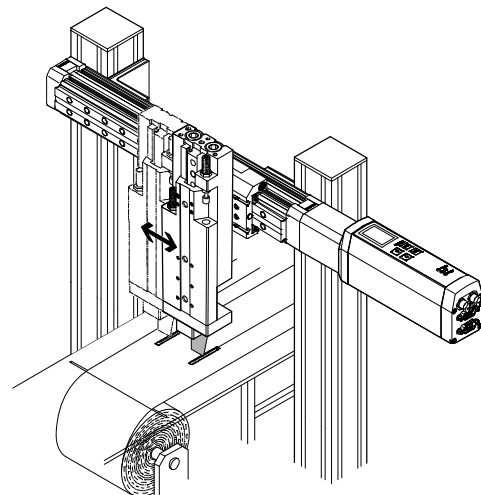


Typical applications

Adjusting sorting conveyors



Programming formats for paper or foil cutting machines



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Type codes

MTR - DCI - 42 S - VC SC - E G7 - H2 IO

Type

MTR	Motor
-----	-------

Motor type

Size

Torque class

S	Standard
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Nominal voltage

VC	24 V DC
VD	48 V DC

Plug design

SC	Straight plug outlet
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Measuring system

E	Encoder
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Gear unit ratio

G7	7:1
G14	14:1
G22	22:1

Parameterisation interface



R2	RS232
H2	RS232 and control panel

Electrical connection technology

IO	I/O interface
CO	CANopen interface
PB	Profibus interface
DN	DeviceNet interface

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Technical data

-  Size
32 ... 62 mm
-  Voltage
24, 48 V DC

Fieldbus interfaces



General technical data				
Size	32	42	52	62
Rotary position generator	Incremental encoder			
Rotary position encoder measuring principle	Optical			
No. of increments/revolution	300 (1,200) ¹⁾	500 (2,000) ¹⁾		
Controller operating mode	PWM MOSFET power amplifier			
Display resolution	128 x 64 pixels			
Type of mounting	Can be bolted on or clamped to gearing unit flange			
Gearing unit type	Planetary gearing			
Gear unit ratio	G7	6.75 (7:1); 1-stage		
	G14	13.73 (14:1); 2-stage		
	G22	–		
				22.21 (22:1); 2-stage

1) Internal 4-fold evaluation

Electrical data – Motor				
Size	32	42	52	62
Nominal voltage [V DC]	24 ±10%			48 –10%/+5%
Nominal current (motor) [A]	0.73	2	5	6.19
Peak current [A]	2.1	3.8	7.7	20
Motor constant [Ncm/A]	4.5	6.1	6.4	12.1
Nominal power (motor) [W]	17	48	122	316
Max. current (digital logic outputs) [mA]	200		60	
Parameterisation interface	RS232; 9,600 baud			

Mechanical data – Motor									
Size	32		42		52		62		
Gear unit ratio	G7	G14	G7	G14	G7	G14	G7	G14	G22
Gearing unit output speed [rpm]	481	237	444	218	444	218	504	248	153
Gearing unit torsional backlash [°]	≤ 1.9	≤ 1.55	≤ 1.3	≤ 0.95	≤ 1.1	≤ 0.75	≤ 1	≤ 1.5	≤ 1.5
Gearing unit output torque [Nm]	0.15	0.29	0.59	1.13	1.62	3.08	3.78	7.2	11.66
Gearing unit efficiency	0.75	0.7	0.8	0.75	0.8	0.75	0.8	0.75	0.75
Mass moment of inertia (rotor) [kg cm ²]	0.024		0.323		1.209		3.3		
Mass moment of inertia (gearing unit) [kg cm ²]	0.00089	0.00149	0.00235	0.00441	0.01132	0.01711	0.017	0.035	0.022
Radial shaft load [N]	40	70	160	230	200	320	240	360	360
Axial shaft load [N]	10	20	50	80	60	100	50	70	70
Product weight [kg]	0.72	0.74	1.72	1.83	3.1	3.3	7.6	8.0	8.0

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Technical data

Operating and environmental conditions				
Size	32	42	52	62
Digital logic outputs	Not electrically isolated		Electrically isolated	
Insulation protection class to VDE 60034	F			
Protection class	IP54			
Protective functions	I ² T monitoring			
	Following error monitoring			
	Software end position detection			
	Voltage failure detection			
	Current monitoring			
	Temperature monitoring: Silicon absolute temperature sensor, switches off at temperatures >70 °C			
Ambient temperature [°C]	0 ... +50			
Storage temperature [°C]	-25 ... +60			
Relative air humidity [%]	0 ... 95 (non-condensing)			
CE mark (see declaration of conformity)	In accordance with EU EMC directive			
Certification	C-Tick			
Note on materials	Contains paint wetting impairment substances			

Materials	
Motor unit housing	Anodised aluminium
Motor unit cover	Aluminium, precision casting, coated (size 62 milled)

Technical data – I/O/fieldbus interface				
Type	MTR-DCI-...-IO	MTR-DCI-...-CO	MTR-DCI-...-PB	MTR-DCI-...-DN
Interface	I/O interface for 15 traversing records and homing	CANopen	Profibus DP	DeviceNet
Number of digital logic inputs	6	–	–	–
Number of digital logic outputs	2	–	–	–
Max. current of digital logic outputs (size)	32/42	200	–	–
	52/62	60	–	–
Bus terminating resistor ¹⁾	–	Not integrated in the device	Not integrated in the device	Not integrated in the device
Communication profile	–	DS301 / FHPP	DP-V0/V1 / FHPP	FHPP
	–	DS301; DSP402	Step7 functional modules	Device type 0C _h
Max. fieldbus baud rate [kbps]	–	1,000	12,000	500

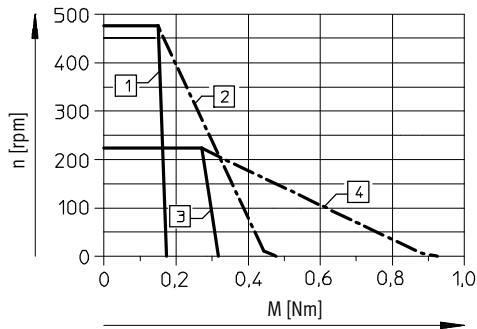
1) Details of bus terminating resistor → 10

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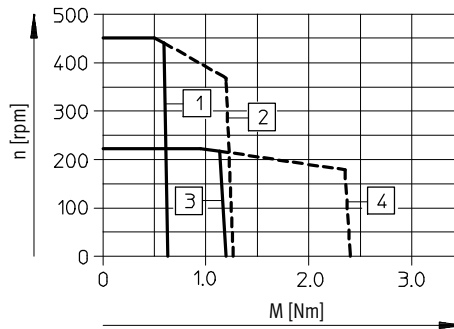
Technical data

Torque M as a function of rotational speed n

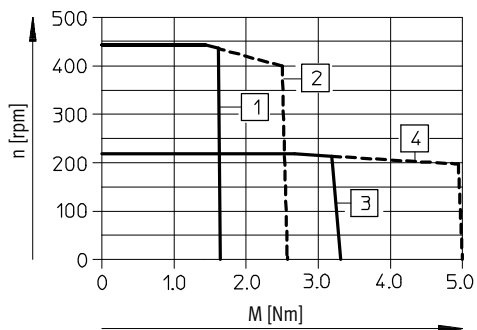
Size 32



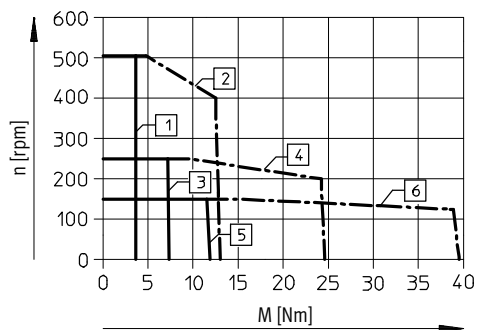
Size 42



Size 52



Size 62



Gear unit ratio 7:1

- 1 Torque, nom.
- 2 Torque, max.

Gear unit ratio 14:1

- 3 Torque, nom.
- 4 Torque, max.

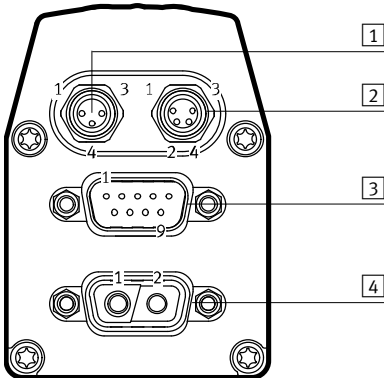
Gear unit ratio 22:1

- 5 Torque, nom.
- 6 Torque, max.

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Technical data

Pin allocation



1 Reference switch, 3-pin M8 socket

Pin	Function
1	24 V
4	Reference input
3	0 V
-	

2 RS 232 interface, 4-pin M8 socket

Pin	Function
1	0 V
2	Transmitted data (TxD)
3	Received data (RxD)
4	-

3 I/O interface, 9-pin Sub-D plug

Pin	Function
1	Traversing record coding, bit 0
2	Traversing record coding, bit 1
3	Traversing record coding, bit 2
4	Traversing record coding, bit 3
5	Start bit
6	Enable bit
7	Ready signal output
8	MC signal output
9	0 V

3 CANopen interface, 9-pin Sub-D plug

Pin	Function
1	-
2	CAN_L
3	CAN_GND
4	-
5	CAN_SHLD
6	CAN_V-
7	CAN_H
8	-
9	CAN_V+

3 Profibus interface, 9-pin Sub-D socket

Pin	Function
1	-
2	Logic_GND
3	RxD/TxD-P
4	CNTR-P
5	DGND
6	VP
7	Logic_V (24 V DC)
8	RxD/TxD-N
9	-

3 DeviceNet interface, 9-pin Sub-D plug

Pin	Function
1	-
2	CAN_L
3	CAN_GND
4	-
5	CAN_SHLD
6	CAN_V-
7	CAN_H
8	-
9	CAN_V+

4 Power supply, 2-pin plug

Pin	Function
1	24 V DC (for MTR-DCI-32/42/52), 48 V DC (for MTR-DCI-62)
2	0 V
-	
-	
-	
-	
-	
-	
-	

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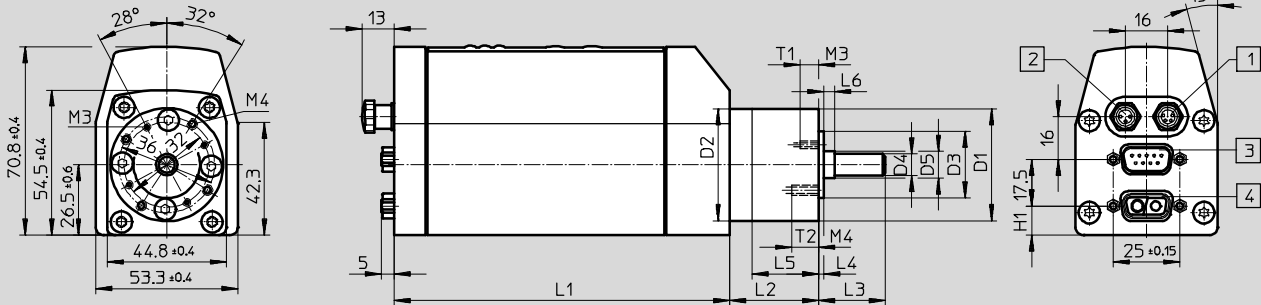
Technical data

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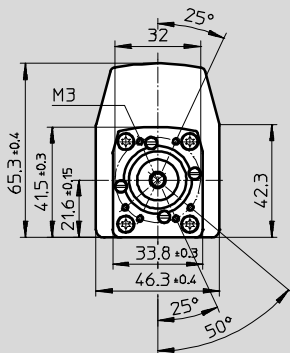
Dimensions

Download CAD data → www.festo.com

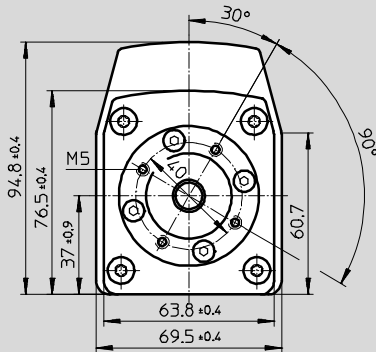
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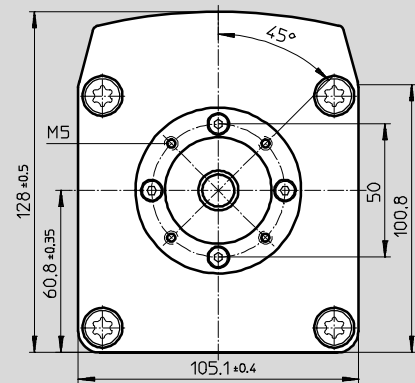
Size 32



Size 52



Size 62



- 1 M8x1, 4-pin
- 2 M8x1, 3-pin

- 3 Sub-D, 9-pin
- 4 Sub-D, 2-pin

Type	D1 ∅ g10	D2 ∅ ±0.1	D3 ∅ h8	D4 ∅ h7	D5 ∅	H1	L1 ±1	L2 ±1	L3	L4	L5	L6	T1	T2 +2
MTR-DCI-32S-...-G7	-	-	21.5	6	-	13±0.2	175.5	-	18.7±0.6	2.5±0.3	-	-	6	-
MTR-DCI-32S-...-G14	-	-	21.5	6	-	13±0.2	175.5	-	18.7±0.6	2.5±0.3	-	-	6	-
MTR-DCI-42S-...-G7	42	42	25	8	-	11	176	33.3	25±1	2±0.1	25	-	7+2	10
MTR-DCI-42S-...-G14	42	42	25	8	-	11	176	46.3	25±1	2±0.1	25	-	7+2	10
MTR-DCI-52S-...-G7	52	52	32	12	-	17.3	194	39	33±1	3±0.3	31	-	10	-
MTR-DCI-52S-...-G14	52	52	32	12	-	17.3	194	53	33±1	3±0.3	31	-	10	-
MTR-DCI-62S-...-G7	62	62	40	14	15	61.3	270	47	39±1	5±0.3	31.3	9	10	-
MTR-DCI-62S-...-G14	62	62	40	14	15	61.3	270	47	39±1	5±0.3	31.3	9	10	-
MTR-DCI-62S-...-G22	62	62	40	14	15	61.3	270	47	39±1	5±0.3	31.3	9	10	-

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Ordering data – Modular products

M Mandatory data										
Module No.	Motor unit		Flange/size		Nominal voltage		Measuring system		Parameterisation interface	
533 736 533 742 533 748 533 754	Motor type		Torque class		Plug design		Gearing unit		Electrical connection technology	
	MTR	DCI	32	S	VC	SC	E	G7	R2	IO
			42		VD			G14	H2	CO
			52					G22		PB
		62								DN
Order example										
533742	MTR	- DCI	- 42	S	- VC	SC	- E	G7	- R2	IO

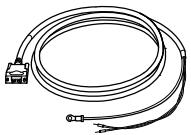

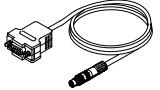
Ordering table										
Size	32	42	52	62	Condi- tions	Code	Enter code			
M	Module No.	533 736	533 742	533 748	533 754					
	Motor unit	Motor unit					MTR		MTR	
	Motor type	DC servo motor with integrated position controller					-DCI		-DCI	
	Flange/size	32	42	52	62		-...			
	Torque class	Standard torque class					S		S	
	Nominal voltage	M] 24 DC				-VC				
			M] -	48 DC			-VD			
	Plug design	Straight plug					SC		SC	
	Measuring system	Encoder					-E		-E	
	Gearing unit	Integrated planetary gearing i = 6.75					G7			
		Integrated planetary gearing i = 13.73					G14			
				Integrated planetary gearing i = 22.21			G22			
	Parameterisation interface	RS232 interface					-R2			
		RS232 interface + control panel					-H2			
	Electrical connection technology	I/O interface					IO			
		CANopen					CO			
		Profibus DP					PB			
		DeviceNet					DN			

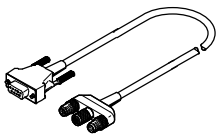
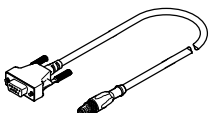
Transfer order code

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Accessories

Ordering data – Cables				
	Brief description	Cable length	Part No.	Type
	Supply cable Allocation →7	2.5 m	537 931	KPWR-MC-1-SUB-9HC-2,5
		5 m	537 932	KPWR-MC-1-SUB-9HC-5
		10 m	537 933	KPWR-MC-1-SUB-9HC-10
	Control cable for I/O connection to any PLC controller Allocation →7	2.5 m	537 923	KES-MC-1-SUB-9-2,5
		5 m	537 924	KES-MC-1-SUB-9-5
		10 m	537 925	KES-MC-1-SUB-9-10
	Programming cable For parameterisation and commissioning via the RS232 interface using FCT software Allocation →7	2.5 m	537 926	KDI-MC-M8-SUB-9-2,5

Ordering data – Plugs				
	Brief description	Part No.	Type	
Fieldbus adapter for Profibus				
	<ul style="list-style-type: none"> – 9-pin Sub-D plug to 5-pin round M12 plug/socket, plus round M12 plug for logic voltage supply – Bus terminating resistor must be connected externally 	537 934	FBA-PB-SUB-9-3XM12	
Fieldbus adapter for CANopen and DeviceNet				
	<ul style="list-style-type: none"> – 9-pin Sub-D plug to 5-pin round M12 plug – Bus terminating resistor must be connected externally 	540 324	FBA-CO-SUB-9-M12	

