

Technical Data Electrical Actuator TPS20 - 20 Nm



Fig. 1 Without position indicator



Fig. 2 With position indicator (not possible for Ex zone 2)

Dimensions actuator with cable entry via cable glands

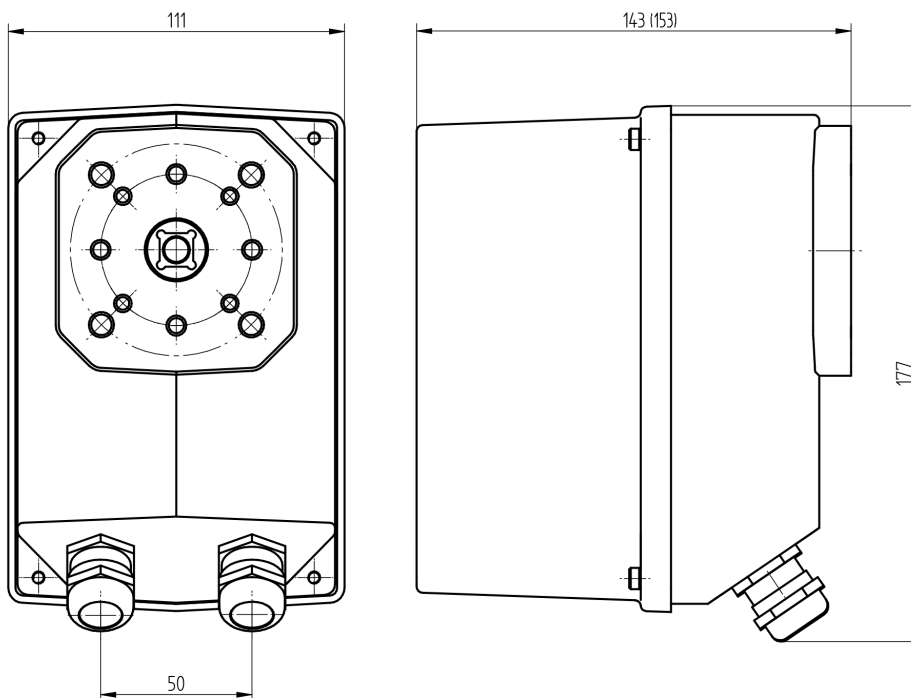


Fig. 3 Dimensioned drawing actuator with cable entry via cable glands

Dimension with standard adaption
F05F07 (H x W x D)

143 x 111 x 177 mm / 5.63 x 4.37 x 4.97" in

Dimension with
Adaption 65 x 50 or
Hole circuit 52 or 68 (H x W x D)

153 x 111 x 177 mm / 6.02 x 4.37 x 4.97" in

Additional space required to open the cover (H)

85 mm / 3.35" in

NOTICE

Depending on the cable entry, the length may vary.

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Dimensions actuator with cable entry via conduit adapter

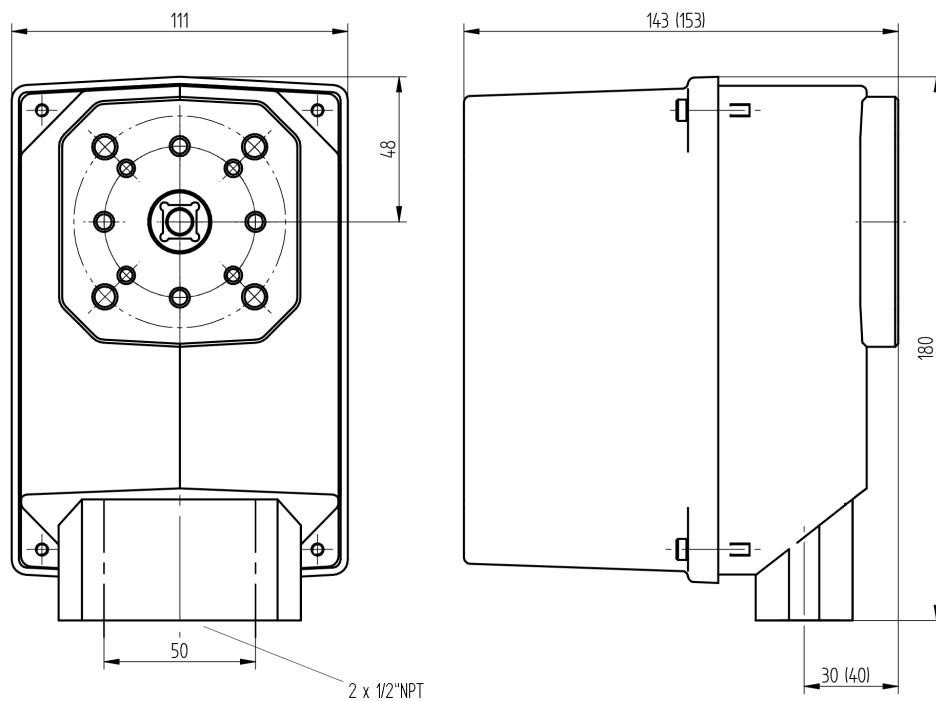


Fig. 4 Dimensions actuator with cable entry via conduit adapter

Dimension with standard adaption
F05F07 (H x W x D)

143 x 111 x 180 mm / 5.63 x 4.37 x 7.09" in

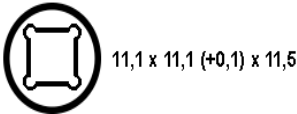
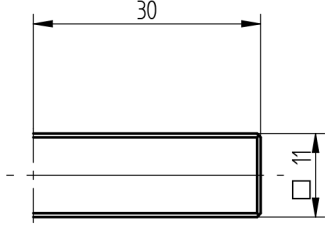
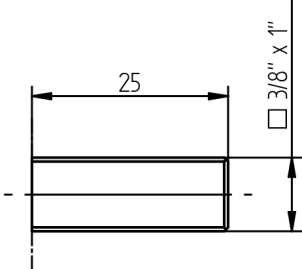
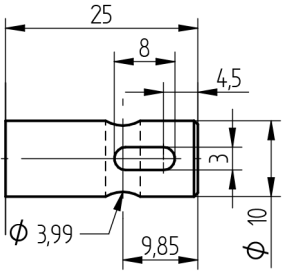
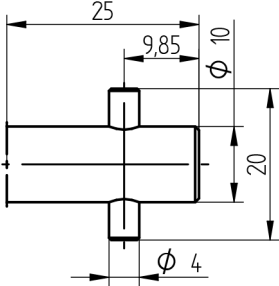
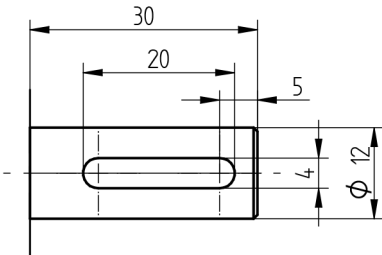

Dimension with
Adaption 65 x 50 or
Hole circuit 52 or 68 (H x W x D)

153 x 111 x 180 mm / 6.02 x 4.37 x 7.09" in

Additional space required to open the cover (H)

85 mm / 3.35" in

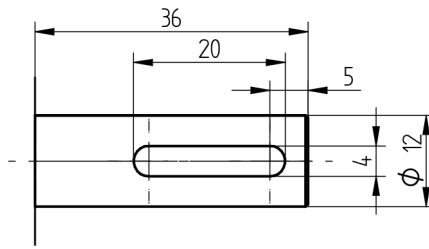
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<p>Form of output shaft (IVK11) Internal square 11.1 x 11.1 x 11.5 mm 0.44 x 0.44 x 0.45" in</p>		
<p>Form of output shaft (VK11 x 11) Square 11 x 11 x 30 mm 0.43 x 0.43 x 1.18" in</p>		
<p>Form of output shaft (VK38 x 1) Square 3/8" x 1"</p>		
<p>Form of output shaft (10 x 25) Round 10 x 25 mm 0.39 x 0.98" in with feather key 3 x 3 x 8 mm 0.12 x 0.12 x 0.31" in and cross drilling Only available for 6 Nm and 20 Nm</p>		
<p>Form of output shaft (10 x 25 V) Round 10 x 25 mm 0.39 x 0.98" in with cross bolt 4 x 20 mm 0.16 x 0.79" in in vertical position Only available for 6 Nm and 20 Nm</p>		
<p>Form of output shaft (12 x 30) Round 12 x 30 mm 0.47 x 1.18" in with feather key 4 x 4 x 20 mm 0.16 x 0.16 x 0.79" in</p>		

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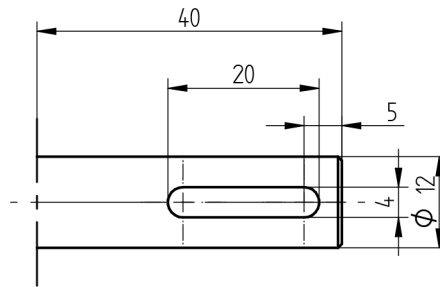
Form of output shaft (12 x 36)

Round 12 x 36 mm | 0.47 x 1.41" in
with feather key 4 x 4 x 20 mm |
0.16 x 0.16 x 0.79" in



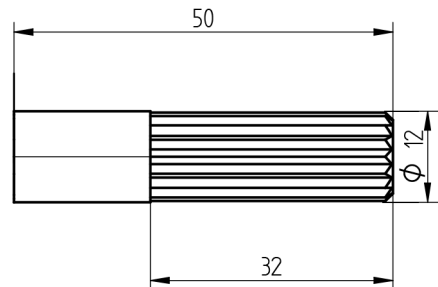
Form of output shaft (12 x 40)

Round 12 x 40 mm | 0.47 x 1.57" in
with feather key 4 x 4 x 20 mm |
0.16 x 0.16 x 0.79" in



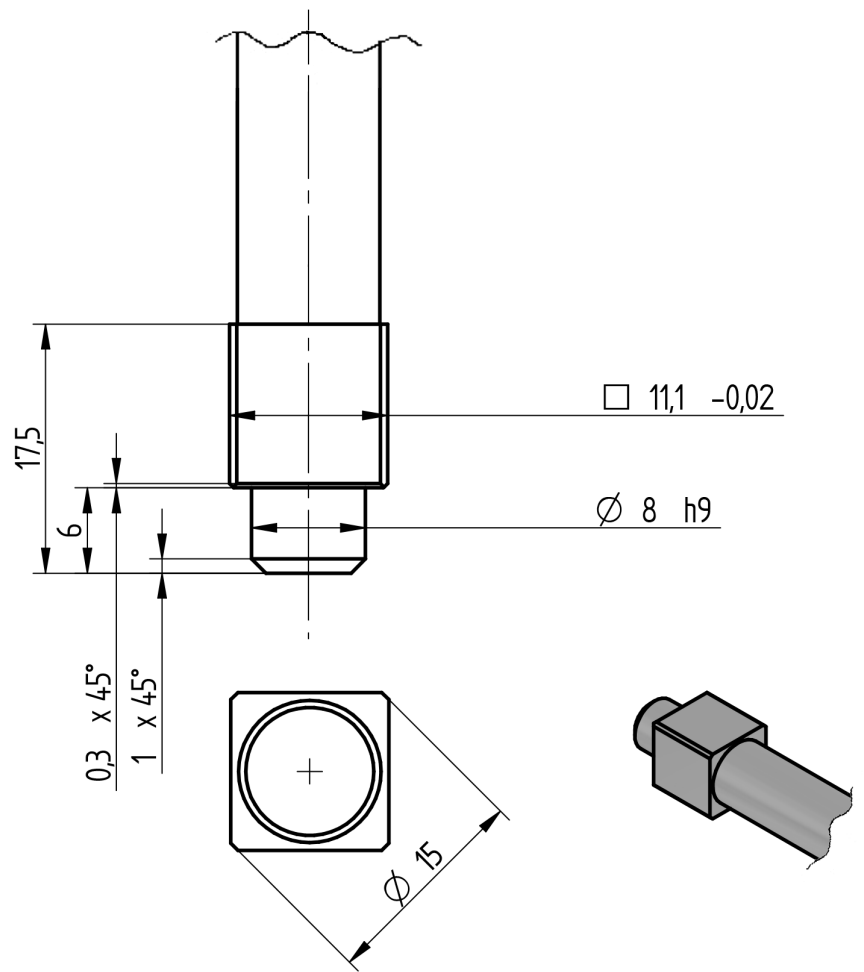
Form of output shaft (KVZD2)

Round 12 x 50 mm | 0.47 x 1.97" in
with spline 10/12 in according to
DIN5481



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Shape of the pluggable square of the output shafts (actuator side)



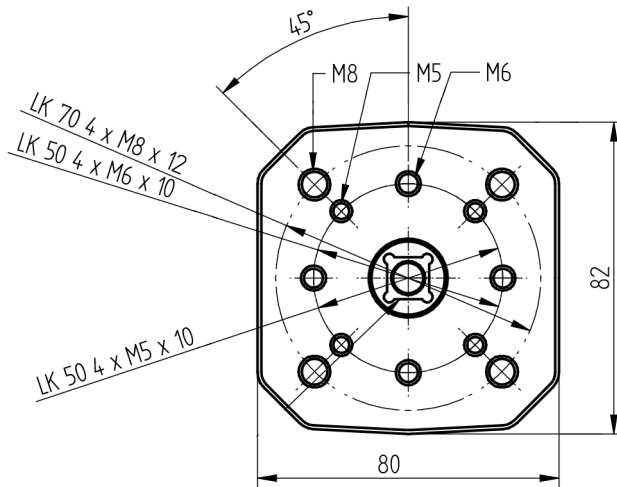
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Adaption (Standard)
(F05F07)

Flange fixing in according to
ISO5211

F05: $\varnothing 50$ 4 x 45° M5 / 4 x M6

F07: $\varnothing 70$ 4 x 45° M8

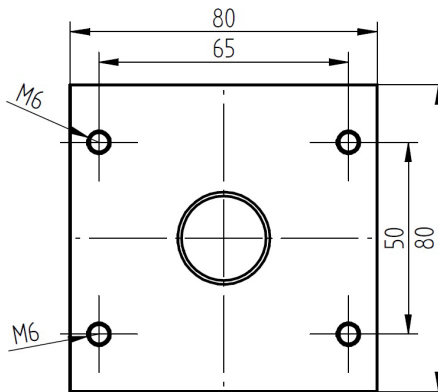


Adaption via adapter plate (65 x 50)

Flange fixing

4 x M6, 65 x 50 mm / 2.56 x 1.97" in

This increases the height of the
actuator by 10 mm / 0.39" in.



Adaption via adapter plate (LK52)

Flange fixing

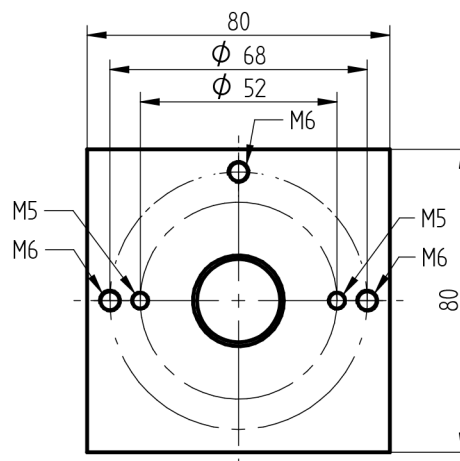
$\varnothing 52$ mm / 2.05" in 2 x M5

(LK68)

Flange fixing

$\varnothing 68$ mm / 2.68" in 3 x M6

This increases the height of the
actuator by 10 mm / 0.39" in.



Technical Data Electrical Actuator TPS20 - 20 Nm

Dimensions Actuator 668M2020		
Dimensions (H x W x D)	143 x 111 x 177 mm / 5.63 x 4.37 x 6.97" in	
Weight	2,3 kg / 5.07 lb (The weight may vary slightly depending on the configuration)	
Material Cover	Die-cast aluminium, powder-coated RAL 3020 traffic red (other colours on request)	
Input Data 668M2020 – Nm		
Standard	Mains voltage	230 VAC
	Power consumption (A15)	28 mA
	Capacitor	0.18 µF/500 V
	Input power synchronous motor	6.45 W
	Output power	1.85 W
Optional	Mains voltage	120 VAC
	Impulse Voltage	2,500 V
	Power consumption (A15)	55 mA
	Capacitor	0.82 µF/250 V
	Input power synchronous motor	6.45 W
Output power	1.85 W	
668M2020 – 20 NM Nominal torque max. (A05)	20 Nm	Holding torque 10 Nm

NOTICE

The peak torque can briefly be 50 to 100% higher than the nominal torque.

The mechanical connection downstream of the shaft must be designed for this.

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Technical specifications	
Overload protection	none
Running time / angel of rotation (A20-6090)	60 s/90° at 50 Hz (48 s/90° at 60 Hz)
Running time / angel of rotation (A20-90135)	optional 90 s/135° at 50 Hz (72 s/135° at 60 Hz)
Running time / angel of rotation (A20-120180)	optional 120 s/180° at 50 Hz (96 s/180° at 60 Hz)
Position feedback (A25-1PO)	Potentiometer 5 kΩ CONTELEC, conductive plastic according to EN12067-2: 2004 annex C Connection to output shaft positive and free of backlash according to EN12067-2: 2004 paragraph 6.2.2) Max. angle of rotation angle 180°
Position feedback (A25-2PO)	optional Additional position feedback Potentiometer 5 kΩ CONTELEC, conductive plastic according to EN12067-2: 2004 annex C Connection to output shaft positive and free of backlash according to EN12067-2: 2004 paragraph 6.2.2) Max. angle of rotation angle 180°
Position feedback (A25-1NOVO)	optional Potentiometer 5 kΩ NOVOTEC, conductive plastic according to EN12067-2: 2004 annex C Connection to output shaft positive and free of backlash according to EN12067-2: 2004 paragraph 6.2.2) Max. angle of rotation angle 90° With NOVOTEC potentiometers, a position indicator or a 2nd potentiometer is not possible.
Direction of rotation (A30-R)	rotation to the right (clockwise 12.00 to 3.00 o'clock with view onto the shaft).
Direction of rotation (A30-L)	optional rotation to the left (anti-clockwise 12.00 to 9.00 o'clock with view onto the shaft)
Option Position indicator (A55-POS1)	optional Position indicator in housing cover (Only possible with CONTELEC potentiometer and for safe area)
Repeatability	0,2°
Radial bearing force	400 N
Damage pattern by mech. overload	Gear unit defect
Board gear	
Gear wheels/backlash	Spur toothed /max. 1°
Bearing	plain bearing/ball bearing, free of maintenance

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Housing Heating	
Option housing heating (A60-HEAT1)	optional housing heating 230 VAC, down to -30 °C -22 °F ambient temperature
Option housing heating (A60-HEAT2)	optional housing heating 120 VAC, down to -30 °C -22 °F ambient temperature
Cable Entry	
Cable entry (A70-M20)	2x cable gland M20 x 1,5, metal, cable Ø min. 8,0 mm, 0.31" in, max. 13,0 mm 0.51" in For Ex zone 2: 2x cable gland M20 x 1,5, metal, for reinforced cables: Ø min. 5,5 mm 0.22" in , max. 8,0 mm 0.31" in Reinforcement max. 0,8 mm Tightening torque body: 5,5 Nm Tightening torque for cap: 13 Nm
Cable entry (A70-M20KS) ¹	optional 2x cable gland M20 x 1,5, plastic cable Ø min. 6,0 mm 0.24", max. 12, mm 0.47" in
Cable entry (A70-M25) ¹	optional 2x cable gland M25 x 1,5, metal, cable Ø min. 14,0 mm 0.55" in, max. 20,0 mm 0.79" in
Cable entry (A70-M16) ¹	optional 2x cable gland M16 x 1,5, metal, cable Ø min. 5,0 mm 0.20" in, max. 9,0 mm 0.35" in
Cable entry (A70-NPT12) ¹	optional Conduit-Adapter 2x ½" NPT, metal, cable Ø max. 9,5 mm 0.37" in
Connecting cable for position feedback	3-pins, shielded 0.52 ... 1.52 (AWG20 ... 14) stripping length 7.5 ... 8.5 mm, 0.5 mm ² ... 1.5 mm ² 0.30 ... 0.14" in, 21 ... 16 AWG
Connecting cable for line voltage Controlling without manual adjusting	4-pins (3+PE) 0.52 ... 2.52 (PE / N / AUF / ZU) length 10 mm, 0.5 mm ² ... 2.5 mm ² 0.39" in, 21 ... 14 AWG
Connecting cable for line voltage Controlling with manual adjusting	5-pins (4+PE) 0.52 ... 2.52 (PE / N / L / AUF / ZU) stripping length 10 mm, 0.5 mm ² ... 2.5 mm ² 0.39" in, 21 ... 14 AWG
Connecting cable for line voltage, controlling, case heating, with/without manual adjusting	5-pins (4+PE) 0.52 ... 2.52 (PE / N / L / AUF / ZU) stripping length 10 mm, 0.5 mm ² ... 2.5 mm ² 0.39" in, 21 ... 14 AWG



¹ Not possible for Ex zone 2!

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Additional switch (only possible in connection with Novotec potentiometer and 120 V supply voltage)

Nominal value	5 A/250 VAC	
Type	Changeover switch	
Switching cam		
Material	POM	
Adjustment tool	Allen key 1.5 mm/0.06 "in	
Setting range	0 ... 360°	
Terminal		
Connection technology	CAGE CLAMP	
Tool	Slotted screwdriver blade 3.5 x 0.5 mm/0.14 x 0.02 "in	
Cable cross-section	0.08 ... 1.5 mm ² /28 ... 16 AWG	
Stripping length	8 ... 9 mm/0.31 ... 0.35 "in	
Terminal assignment	21	S3 middle
	22	S3 switch NO
	23	S3 switch NC
	24	S4 middle
	25	S4 switch NO
	26	S4 switch NC

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Ex zone 2		
Device marking		II 3G Ex nR IIB T6 Gc II 3D Ex tc IIIB T80°C Dc
		Ex nR IIB T6 Gc Ex tc IIIB T80°C Dc
	Class I, Division 2, Groups C and D Hazardous Locations	
	Class I, Zone 2, AEx nR IIB T6 Gc	
	Class I, Zone 2, Ex nR IIB T6 Gc	
Certificate numbers	ATEX	CSANe 23ATEX1129X
	IECEX	IECEX CSAE 23.0031X
	UL Listed	E549882
Screwed cable glands	2 x screwed cable gland M20 x 1,5 metal PM-SA Certificate number: IECEX IMQ 24.0004X Cable Ø min. 5.5 mm 0,22" in, max. 8 mm 0.31" in Reinforcement max. 0.8 mm 0.0315 " in Tightening torques: Body 5,5 Nm Cover 13 Nm May only be used with the seal supplied by the manufacturer. Use only within the scope of application ATEX & IECEX	
	2 x screwed cable gland M20 x 1,5 metal A2F100 Certificate number: IECEX CML 18.0172 Cable Ø min. 7 mm 0.28" in, max. 13.5 mm 0.53" in Tightening torques: Body 12.5 Nm Cover 12.5 Nm May only be used with the seal supplied by the manufacturer. Use for all approvals	

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Operating Condition

Life time	The actuators exceed the service life requirements of EN 15714-2 Class C 'Modulation'. 250'000 starts in OPEN/CLOSED direction. (Detailed information on request).
Mounting position	any, but not hanging downwards
Positioning accuracy	< 1 %
Installation height	≤ 2,000 m 6,561.68 ft above sea level > 2,000 m 6,561.68 ft above sea level on request

Environmental conditions

Storage		In according to DIN EN 60721-3-1, class IE12
	relative temperature range	-25 °C ... +55 °C -13 °F ... 131 °F
	relative air humidity	< 95 %
Transport		In according to DIN EN 60721-3-2, class IE23
	relative temperature range	-25 °C ... +60 °C -13 °F ... 140 °F
	relative air humidity	< 95 %
Operation		Class IE36 in according to DIN EN 60721-3-2
	relative temperature range	-10 °C ... +60 °C 14 °F ... 140 °F with additional case heating -30 °C ... +60 °C -22 °F ... 140 °F
	relative air humidity	< 95 %
	Pollution Degree	4
Degree of protection	according to DIN EN 60529	IP65

EU Declaration of Conformity

2014/35/EU	Low Voltage Directive
2014/30/EU	EMC Directive
2014/68/EU	Pressure Equipment Directive Kat. 4 Mod. B+D
(EU) 2016/426	Gas Appliance Regulation (GAR)
2011/65/EU	RoHS

NOTICE

The limits of the technical data must be strictly adhered to.

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Order Information

NOTICE

All options marked with * correspond to the standard selection.

Description/Type	Order no.
Electrical actuator 20 Nm, TPS, position feedback potentiometer 5 kΩ, conductive plastic, 2 end position switches to limit the actuator, electric hand feed, IP65	668M2020
A05 "NOMINAL TORQUE"	
Description/Type	Selection
NOMINAL TORQUE 20 Nm	20NM*
A10 "FORM OF OUTPUT SHAFT"	
Description/Type	Selection
SQUARE HOLLOW SHAFT 11 x 11 mm / 0.44 x 0.44" in	IVK11*
SQUARE SHAFT 11 x 11 mm / 0.44 x 0.44" in	VK11
SQUARE SHAFT 3/8" x 1"	VK38x1
ROUND SHAFT 10 x 25 mm / 0.39 x 0.98" in WITH PARALLEL KEY 3 x 3 x 8 mm / 0.12 x 0.12 x 0.31" in	10x25
ROUND SHAFT 12 x 30 mm / 0.47 x 1.18" in WITH PARALLEL KEY 4 x 4 x 20 mm / 0.16 x 0.16 x 0.79" in	12x30
ROUND SHAFT 12 x 36 mm / 0.47 x 1.41" in WITH PARALLEL KEY 4 x 4 x 20 mm / 0.16 x 0.16 x 0.79" in	12x36
ROUND SHAFT 12 x 40 mm / 0.47 x 1.57" in WITH PARALLEL KEY 4 x 4 x 20 mm / 0.16 x 0.16 x 0.79" in	12x40
ROUND SHAFT 12 x 40 mm / 0.47 x 1.97" in, SPLINE 10/12, IN ACC. TO DIN5481 DIN5481	KVZD2
D-SHAFT d1=10 / 0.39 x d2=8.5 / 0.33 x L=25 mm / 0.98" in, INCL. ADAPTER PLATE for VKP-VALVE SIEMENS	D10x25
A15 "POWER SUPPLY VOLTAGE"	
Description/Type	Selection
120 VAC/50 Hz	120 VAC
230 VAC/50 Hz	230 VAC*
A20 "RUNNING TIME / ANGLE OF ROTATION"	
Description/Type	Selection
60 SECONDS/90° (60 SEC./50 HZ/48 SEC./60 HZ)	6090*
90 SECONDS/135° (90 SEC./50 HZ/72 SEC./60 HZ)	90135
120 SECONDS/180° (120 SEC./50 HZ/96 SEC./60 HZ)	120180
A25 "POSITION FEEDBACK"	
Description/Type	Selection
1x POTENTIOMETER 5 kΩ CONTELEC, CONDUCTIVE PLASTIC, APPROVED IN ACCORDANCE TO EN12067-2, FORM CLOSURE CONSTRUCTION, FREE OF BACKLASH, Position feedback only for CMS	1PO*
2x POTENTIOMETER 5 kΩ CONTELEC, CONDUCTIVE PLASTIC, APPROVED IN ACCORDANCE TO EN12067-2, FORM CLOSURE CONSTRUCTION, FREE OF BACKLASH, Position feedback only for CMS	2PO
1x POTENTIOMETER 5 kΩ NOVOTEC, CONDUCTIVE PLASTIC, APPROVED IN ACCORDANCE TO EN12067-2, FORM CLOSURE CONSTRUCTION, FREE OF BACKLASH, Position feedback for ETAMATIC, FMS, VMS, CMS With NOVOTEC potentiometers, a position indicator or a 2nd potentiometer is not possible.	1NOVO

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A30 "DIRECTION OF ROTATION" (view onto the shaft, parallel key at 12.00 o'clock)	Selection
CLOCKWISE (12.00 TO 3.00 O'CLOCK)	R*
ANTI CLOCKWISE (12.00 TO 9.00 O'CLOCK)	L

A40 "ADAPTION"	Selection
FLANGE FIXINIG IN ACCORDANCE TO ISO5211	F05F07*
– F05 Ø50 mm 1.97" in, 4 x 45° M5 / 4 x 45° M6	
– F07 Ø70 mm 2.76" in, 4 x 90° M8	
FLANGE FIXINIG Ø52 mm 2.05" in, 2 x M5 ¹	LK52
FLANGE FIXINIG Ø68 mm 2.68" in, 3 x M6 ¹	LK68
FLANGE FIXINIG 4 x M6, 65 x 50 mm 2.56 x 1.97" in ¹	65 x 50
ADAPTION IN ACCORDANCE TO CUSTOMER SPECIFICATION	

¹ Adaptation via adapter plate. This increases the height of the actuator by 10 mm | 0.39" in.

A45 "COLOUR"	Selection
COVER RED RAL3020	RT*
COVER BLACK RAL9005	SW
COVER ANTHRACITE RAL7016	AZ
CORROSION PROTECTION CATEGORY C4 ²	C4
COVER and CORPUS RAL7035 LIGHT GREY	
Further colours on request	

² Not possible for Ex zone 2

A50 "CUSTOMER"	Selection
LAMTEC TYPE	S*

A55 "POSITION INDICATOR"	Selection
WITHOUT	POS0*
POSITION INDICATOR ³ IN THE COVER ⁴	POS1

³ Not possible for Ex zone 2.

⁴ Only possible with CONTELEC potentiometer.

A60 "HOUSING HEATING"	Selection
WITHOUT DOWN TO -10 °C	HEAT0*
HOUSING HEATING 230 V/25 W DOWN TO -30 °C	HEAT1
HOUSING HEATING 120 V/12 W DOWN TO -30 °C	HEAT2

A70 "CABLE ENTRY"	Selection
2x CABLE GLAND M16 METAL ⁶	M16
2x CABLE GLAND M20 METAL ⁶	M20*
2x CABLE GLAND M20 PLASTIC BLACK ⁵	M20KS
2x CABLE GLAND M25 METAL ⁶	M25
CONDUIT ADAPTER 2x ½" NPT ⁶	NPT12
CABLE GLAND IN ACCORDANCE TO CUSTOMER SPECIFICATION ⁶	

⁵ If the Ex version is selected in attribute A05, the cable glands are also designed in the Ex version.

⁶ Not possible for Ex zone 2

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A90 "ADDITIONAL SWITCH" ¹

Selection

WITHOUT

0

2 ADDITIONAL SWITCHES

2ZS

¹ Additional switch only possible in connection with Novotec potentiometer and 120 V power supply.

A99 "SPECIAL CONFIGURATION"

Selection

WITHOUT

SO0*

Approvals



The information in this publication is subject to technical changes.



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