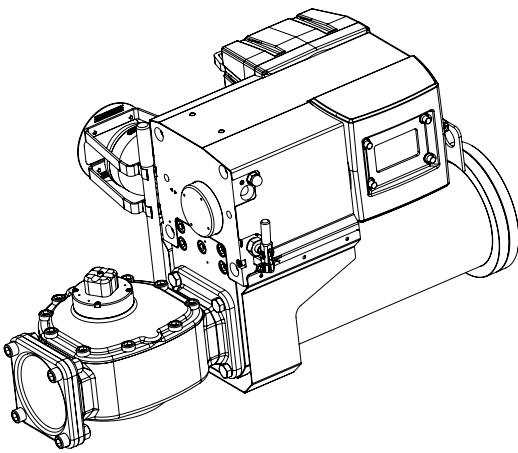


TriVAX® Compact Scotch Yoke

Operating angle 90°

Technical Data



“OUR TRIVAX VALVE ACTUATOR HAS A PIPING-FREE DESIGN WITH A CLOSED AND PRECHARGED HYDRAULIC SYSTEM WHICH MAKES IT UNIQUE. THEREBY WE PROVIDE A COMPACT DESIGN, LOWEST MAINTENANCE COSTS AND A VERY SIMPLE AND QUICK INSTALLATION.”

GOTTHARD GAWENS, GLOBAL PRODUCT MANAGER TRIVAX

TriVAX® Compact Scotch Yoke

Electrohydraulic valve actuator Operating angle 90°

The HOERBIGER TriVAX valve actuation concept combines the advantages of the existing valve actuation systems. As it is an electric actuator with fluidic gear, it is easy to install, doesn't need any other power infrastructure than the electric, an integrated operating and diagnostic tool is possible to include and has the opportunity to integrate safety functions or quick operation features very easily.

Thanks to the tubeless construction potential leakages are avoided. TriVAX Compact is the actuator for valves with medium Force-/Torque requirements with flexible control possibilities.

As TriVAX Compact are designed as safety actuators you will have fail close- and fail open-spring return actuator versions available. The operating spring ending forces for linear actuators are in the range of 4 to 16 kN, while the quarter turn actuators are able to apply spring ending torques from 500 to 6000 Nm.

TriVAX Compact is suitable for hazardous areas with a needed protection level up to ATEX II 2 G/D Ex d IIC T4 / IP67. The standard weather protection is IP65 and IP67.

TriVAX Compact is an integrated actuator unit which incorporates a combined hydraulic-spring-cylinder which is driven by an electro-hydraulic high pressure power unit. The electronic control unit with intuitive Human-Machine Interface is included.

Features:

- Completely closed hydraulic system
- Compact design
- Tubeless architecture
- Integrated safety functions (Fail-Safe/ESD)
- Ease of installation
- Flexible application possibilities
- Small electric power consumption
- Separate terminal compartment
- Modular construction

Customer Benefits:

- Plug & Work – easy installation and intuitive handling
- Reliable and efficient operation
- Flexible application possibilities with one product platform

CHARACTERISTICS

Operating Voltage	3ph / 400 V / 50/60 Hz For other Voltages contact manufacturer
Tolerances	Voltage ± 10% – Frequency: ± 5%
Power consumption	770 W @ 50 Hz 930 W @ 60 Hz
Position accuracy	± 2% of control range/Full stroke (Positioning)
Ambient Temperature	-25°...+70° C
Protection Class	IP 65 / IP 67
Explosion protection	ATEX Ex II2G/D EEx d IIC T4 / IP67
Corrosion protection	DIN EN ISO 12944-2 Category C3 (medium) Optional: DIN EN ISO 12944-2 Category C5M
Manual operation	Handpump (optional)
Mounting position	Each position possible
Maintenance period	5 years / up to 10000 cycles (switching) / 1800000 starts (positioning) Number of cycles / starts depends on actuator size
Life time	10 years / 2x DIN EN 15714-2 (up to 20.000 cycles / 3,6 Mio starts)
SIL	SIL 2 for FS MECHANIC SIL 3 for systemic integrity

IN-/ OUTPUTS AND ACTUATOR SIZES

TriVAX® Compact Scotch Yoke 90°

CONTROL CONFIGURATION	ON/OFF
Inputs	4 x digital input 24 V DC (solid state) externally powered Open / Stop / Close Function programmable 1 x Input ESD (Function: 1oo1)
Outputs	4 x Relais output programmable 1 x Monitor-Relais (Change-over-contact) 1 x Output (Change-over-contact) ESD ready
Auxiliary Voltage	24 V DC / 200 mA to supply the digital inputs; isolated from internal electronics
Optional Modules	Module with 4 additional digital outputs (programmable) Analogue Output 4-20 mA (Position retransmission) 2 x Input ESD (Function: 1oo2) 3 x Input ESD (Function: 2oo3)

CONTROL CONFIGURATION	POSITIONING
Inputs	4 x digital input 24 V DC (solid state) externally powered Open / Stop / Close Function programmable 1 x Input ESD (Function: 1oo1) 1 x Analogue Input 4-20 mA (set point position)
Outputs	4 x Relais output programmable 1 x Monitor-Relais (Change-over-contact) 1 x Output (Change-over-contact) ESD ready 1 x Analogue Output 4-20 mA (Position retransmission)
Auxiliary Voltage	24 V DC / 200 mA to supply the digital inputs; isolated from internal electronics
Optional Modules	Module with 4 additional digital outputs (programmable) Bussystems: in preparation 2x Input ESD (Function: 1oo2) 3x Input ESD (Function: 2oo3)

ACTUATOR SIZE SCOTCH YOKE	2001	2002	2003	2004	2005
Torque quarter turn [Nm] Spring Ending	434 Nm	910 Nm	1861 Nm	3911 Nm	5518 Nm
Operating Angle	90° / mechanically adjustable +/- 5° in each end position				
Operating time standard @ 90°	15 sec	15 sec	29 sec	60 sec	110 sec
Fast operating @ 90°	< 1 sec / 90°	< 1 sec / 90°	< 1 sec / 90°	< 2 sec / 90°	< 3 sec / 90°

CONTROL CONFIGURATION

TriVAX® Compact Scotch Yoke 90°

CONTROL CONFIGURATION	ON/OFF
Functional scope	OPEN / CLOSE
Duty Cycle	S2 – 10 min
Intuitive Human-Machine-Interface	Selector switch Local /Off/ Remote (padlockable) 4 x Soft-key-Pushbutton Display for visualization of actuator status, configuration and parametrizing, diagnostics
DIGITAL IN-/OUTPUTS	
Digital Inputs	4 (24 VDC) Configurable for Latched operation, Push-to-Run operation or 2-Wire Control 1 x ESD (1oo1)
Digital Outputs	4 Relay-Outputs Voltfree Configurable as MAKE or BREAK Contacts for status signals 1 x Monitor Relais (Change-Over-Contact) 1 x ESD Ready (Change-Over-Contact)
Position detection	✓
Mech. Position indication	Beacon
Junction box	Junction box to connect all components electrically
Manual operation	Option
Quick acting spring return function	Option
Ex proof (ATEX)	Option
Analogue Output	Option

CONTROL CONFIGURATION	POSITIONING
Functional scope	Positioning
Duty Cycle	S4 – 25%
Position Accuracy	2% Full stroke
Intuitive Human-Machine-Interface	Selector switch Local /Off/ Remote (padlockable) 4 x Soft-key-Pushbutton Display for visualization of actuator status, configuration and parametrizing, diagnostics
DIGITAL IN-/OUTPUTS	
Digital Inputs	4 (24 VDC) Configurable for Latched operation, Push-to-Run operation or 2-Wire Control 1 x ESD (1oo1)
Digital Outputs	4 Relay-Outputs Voltfree Configurable as MAKE or BREAK Contacts for status signals 1 x Monitor Relais (Change-Over-Contact) 1 x ESD Ready (Change-Over-Contact)
ANALOGUE IN- /OUTPUTS	
Analogue Input	1x 4-20 mA
Analogue Output	1x 4-20 mA

CONTROL CONFIGURATION

TriVAX® Compact Scotch Yoke 90°

CONTROL CONFIGURATION	POSITIONING
Position detection	✓
Mech. Position indication	Beacon
Junction box	Junction box to connect all components electrically
Manual operation	Option
Quick acting spring return function	Option
Ex proof (ATEX)	Option
Fieldbus	Option (in preparation)

AVAILABILITY CONTROL FUNCTION/FUNCTION

FUNCTION	FUNCTIONAL SCOPE CONTROL	
	On Off	Positioning
OPEN / CLOSE	✓	✓
Positioning	–	✓
Digital Inputs	✓	✓
Digital Outputs	✓	✓
Analogue Input	–	✓
Analogue Output	○	✓
Auxiliary Voltage	✓	✓
Human-Machine-Interface	✓	✓
Mech.Position indication	✓	✓
Position detection	✓	✓

AVAILABILITY CONTROL FUNCTION/OPTION

OPTION	FUNCTIONAL SCOPE CONTROL	
	On Off	Positioning
Manual operation	○	○
Additional digital outputs	○	○
Fieldbus	–	in preparation
Ex proof (ATEX)	○	○
SIL	○	○
Quick acting spring return function	○	○
Ambient Temperature: ARCTIC	in preparation	in preparation

Legend:

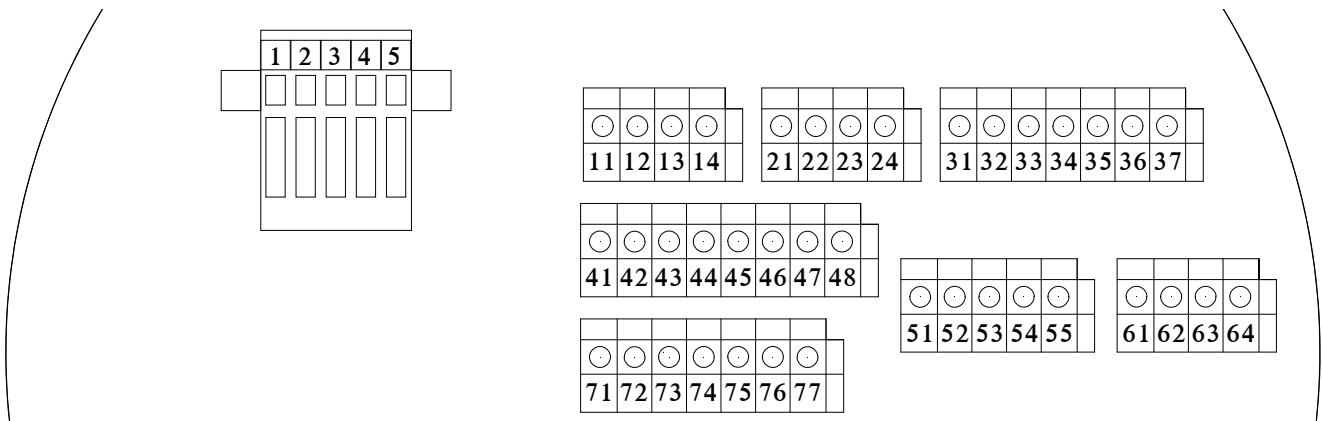
✓ available as standard

○ available as an option on special request

– not available

TERMINAL BLOCK

TriVAX® Compact Scotch Yoke 90°



TERMINAL BLOCK

OPERATING VOLTAGE – TERMINALS 1 – 5

L1-L2-L3 + Ground wire + N

DIGITAL INPUTS AND AUX. VOLTAGE – TERMINALS 31 – 37

Digital Inputs 1 – 4 Assignment depends on configuration	Latched operation	DI1: OPEN DI2: CLOSE DI3: STOP DI4: Configurable
	Push-to-Run operation	DI1: OPEN DI2: CLOSE DI3: Configurable DI4: Configurable
	2-Wire Control	DI1: Control Input OPEN/CLOSE DI2: Configurable DI3: Configurable DI4: Configurable
Aux. voltage	24 V DC, Max. 200 mA	

ESD IN- / OUTPUTS – TERMINALS 71 – 77

ESD IN – 1-3 Input 24 V DC	1oo1: At Low-Signal ESD will be released Option 1: 1oo2: At Low-Signal at minimum one Input, ESD will be released Option 2: 2oo3: At Low-Signal at minimum two Inputs, ESD will be released
ESD ready OUT Change-over relay	When ESD Monitoring is active a message is displayed by means changeover relay.

VOLTFREE OUTPUTS TERMINALS 41 – 48

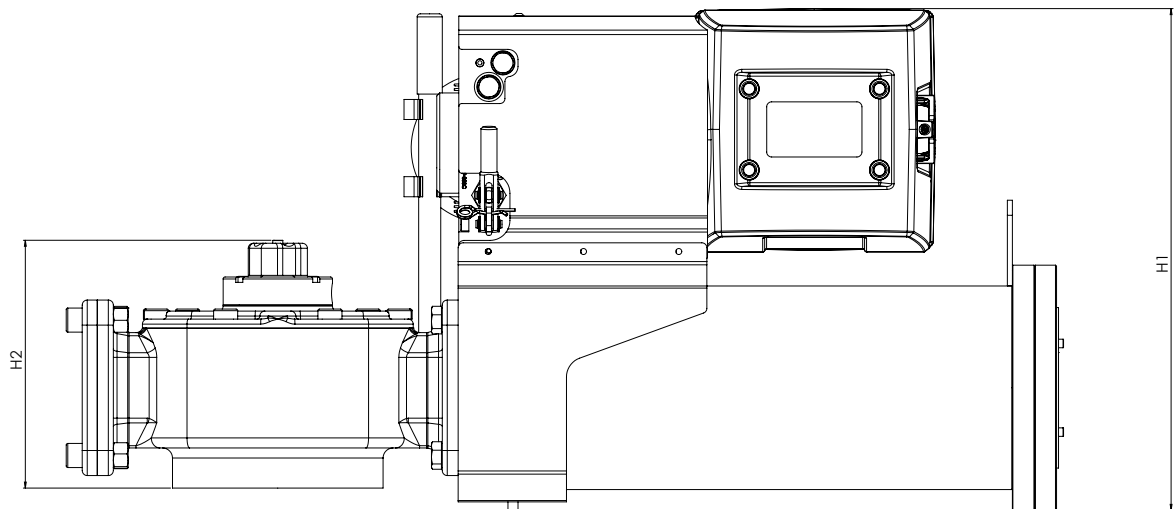
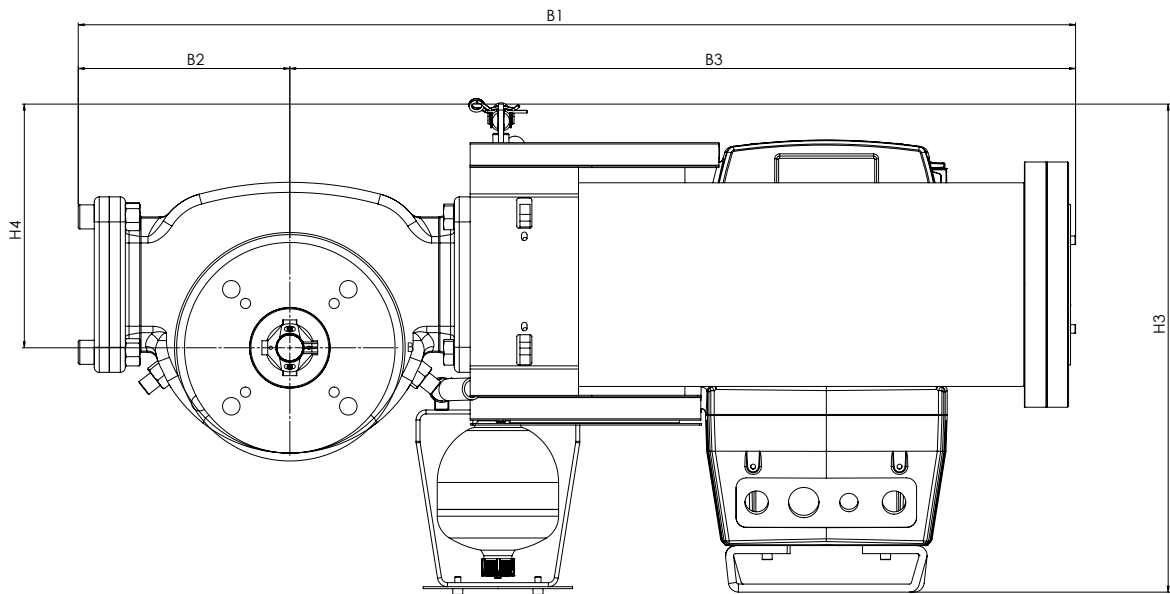
Digital Outputs 1 – 4 Assignment depends on configuration	Default Values	DO1: End pos. OP DO2: End pos. CL DO3: Actuator moves DO2: Selector Switch LOCAL
Monitor relay	A message is displayed by means change-over relay, when remote control of actuator is not possible.	

ANALOGUE IN- / OUTPUTS – TERMINALS 11 – 14

Analogue Input	Set point of actuator position
Analogue Output	Retransmission of actual actuator position

DIMENSIONS TRIVAX COMPACT LINEAR

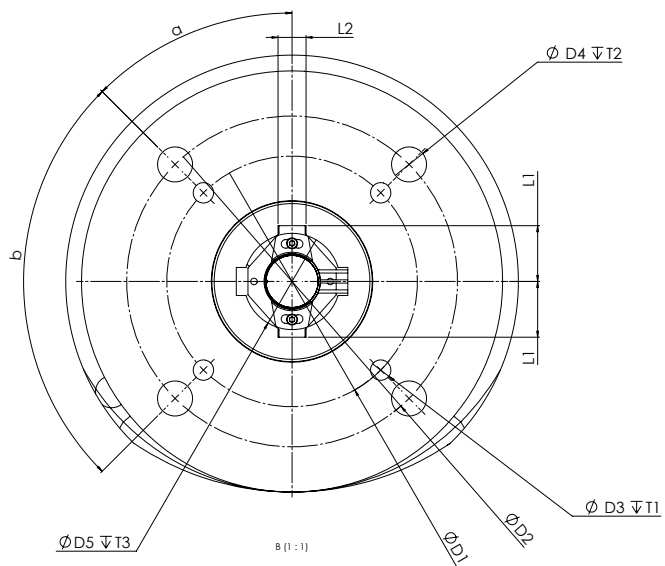
TriVAX® Compact Scotch Yoke 90°



Size	B1	B2	B3	H1	H2	H3	H4	D1	D2	D3 x T1	D4 x T2
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
1				500							
2	994	211	604	500	247		240	125	165	4 x M12 x 20	4 x M20 x 30
3				515		483					
4				690							
5	1440	314	1126	690	351		307	254	298	8 x M16 x 24	8 x M20 x 30

DIMENSIONS CONNECTING FLANGES

TriVAX® Compact Scotch Yoke 90°



D5 x T3	L1	L2	Weight
[mm]	[mm]	[mm]	[kg]
48 x 170	28	14	174
			181
			191
98 x 265	55	28	450
			475

POSSIBLE CONFIGURATIONS TRIVAX INTERFACES AND DIAGNOSTICS

TriVAX® Compact Scotch Yoke 90°

CONFIGURATIONS

DIGITAL INPUTS

Block LOCAL operation	Configurable as active HIGH or as active LOW Input
Start partial stroke test	
Error ack	
Interlock REMOTE	

VOLTFREE OUTPUTS

Calibration complete	Configurable as active HIGH or as active LOW Output
LOCAL blocking active	
Position OPEN	
Position CLOSED	
Actuator moves	
Failure	
Maintenance required	
Out of specification	
Functional check	
Selector LOCAL	
Selector REMOTE	
Selector NULL	
Partial Stroke Test not OK	
Partial Stroke Test active	
Partial Stroke Test OK	
Actuator ready	

ANALOGUE INPUT

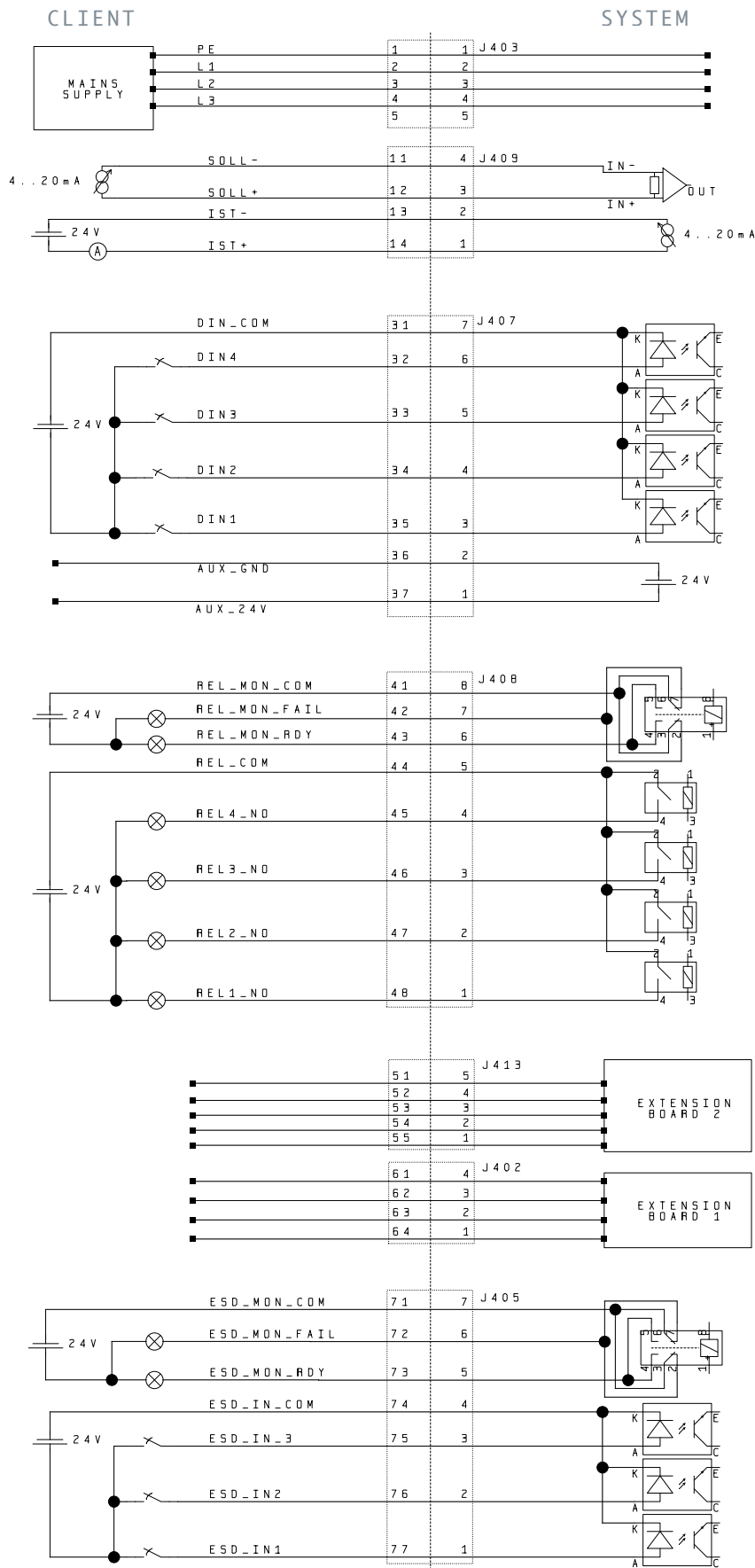
Threshold control	
Positioner	

PARTIAL STROKE TEST

PST Direction	OPEN or CLOSE
PST Angle	3 – 99 %
PST Reference value TriVAX 2300	Ref.characteristic/ max. limit
PST tolerance	0 – 100 %
PST Activation	Control room/ time interval 1 – 999 days

WIRING PROPOSAL

TriVAX® Compact Scotch Yoke 90°



ORDERING CODE

TriVAX® Compact Scotch Yoke 90°

CODE	DESCRIPTION	COMMENT
TRIVAX		
TX		
ACTUATOR		
1	TriVAX Compact Linear	
2	TriVAX Compact Quarter Turn	Scotch Yoke
FUNCTION		
2	On/Off	
3	Positioning	
SAFETY FUNCTION		
4	FS Mechanic OP—ESD 1oo1	Linear: CL = Piston extended Quarter-turn: Clockwise to Close
5	FS Mechanic CL—ESD 1oo1	
6	FS Mechanic OP—ESD disabled	
7	FS Mechanic CL—ESD disabled	
9	FS Mechanic OP invers —ESD 1oo1	Linear: CL = Piston retracted Quarter-turn: Counter-Clockwise to Close
0	FS Mechanic CL invers —ESD 1oo1	
A	FS Mechanic OP invers—ESD disabled	
B	FS Mechanic CL invers—ESD disabled	
C	FS Mechanic OP invers —ESD 1oo2	
D	FS Mechanic CL invers —ESD 1oo2	
E	FS Mechanic OP invers —ESD 2oo3	Linear: CL = Piston extended Quarter-turn: Counter-Clockwise to Close
F	FS Mechanic CL invers —ESD 2oo3	
K	FS Mechanic OP—ESD 1oo2	
L	FS Mechanic CL—ESD 1oo2	
M	FS Mechanic OP—ESD 2oo3	
N	FS Mechanic CL—ESD 2oo3	
OPERATING FORCE / SIZE		
	Linear	Quarter Turn
1	4 kN	500 Nm
2	8 kN	1000 Nm
3	16 kN	2000 Nm
4		4000 Nm
5		6000 Nm
STROKE		
–	Quarter Turn actuator 90°	
D	150 mm	
F	300 mm	
VOLTAGE		
1	3ph / 400V / 50/60 Hz	Not yet available
2	1ph / 230V / 50/60 Hz	
3	3ph / 480V / 50/60 Hz	
4	1ph / 110V / 50/60 Hz	

ORDERING CODE

TriVAX® Compact Scotch Yoke 90°

CODE	DESCRIPTION	COMMENT
PROTECTION CLASS/APPROVAL		
A	SIL / IP65	
B	SIL / ATEX	
M	IP65	
N	ATEX	
TEMPERATURE RANGE		
1	Standard	-25°...+70 °C
FIELDBUS/REMOTE CONTROL		
0	without	
A	Module: 4 voltfree outputs	
B	Module: 1 analogue output	
C	Module combination: A + B	
MOUNTING ORIENTATION CABLE ENTRIES		
A	0°	Standard Quarter turn
B	90°	Standard Linear
C	180°	
D	270°	
OPTIONAL FEATURES		
0	without	
1	Hand pump	
2	Trip	Quick acting spring return time (adjustable)
3	Hand pump + Trip	
ELECTRIC/MECHANIC CONNECTION		
1	Cable entry metric / mech. Connection Standard (see dimensional drawing)	
5	Cable entry NPT (with adaptors) / mech. Connection Standard (see dimensional drawing)	
CORROSION PROTECTION		
1	Standard	Acc. ISO 12944-2 C3
2	Off-Shore	Acc. ISO 12944-2 C5M
6	Special colour	Customized

NOTES

TriVAX® Compact Scotch Yoke 90°

NOTES

TriVAX[®] Compact Scotch Yoke 90°

HOERBIGER AUTOMATISIERUNGSTECHNIK GmbH

Südliche Römerstraße 15
86972 Altenstadt, Germany
Tel. +49 (0)8861 221-0
Fax +49 (0)8861 221-1305
E-Mail: info@hoerbiger.com
www.hoerbiger.com



TECHNICAL DATA AND ILLUSTRATIONS The technical data and figures were compiled with great care and to the best of our knowledge. HOERBIGER accepts no liability for the currentness, correctness and completeness of this information. The content of this catalog shall not be construed as a quotation in the legal sense. A written order confirmation from HOERBIGER, which is provided exclusively subject to HOERBIGER's General Sales and Delivery Terms and Conditions, shall be decisive for the execution of the contract. You can obtain these from our Sales Department or from our website at: www.hoerbiger.com. The data and information, such as figures, drawings, descriptions, dimensions, weights, materials, technical and other deliverables contained in general product descriptions, HOERBIGER catalogs, brochures and price lists in any form, as well as the described products and services are subject to change and may be amended or updated at any time without prior announcement by HOERBIGER. They are binding only to the extent that they are expressly referenced in the contract or the order confirmation. Minor deviations from such product-describing information shall be deemed accepted and do not affect the performance of contracts, to the extent they are within reason for the customer. This catalog contains no express or implied guarantees, warranted qualities, or representations and warranties whatsoever on the part of HOERBIGER for the represented products, also with regard to the availability of the products. To the extent it is allowed by law, any liability on the part of HOERBIGER is hereby excluded for direct or indirect damage, consequential damage, claims regardless of type and on whatever legal grounds, which are caused by the use of information contained in this catalog. The liability disclaimer shall not apply to deceit, intent or gross negligence, injury to life, limb or health, or where unlimited liability is prescribed by law.

TRADEMARK, COPYRIGHT AND DUPLICATION The representation of industrial property rights such as brands, logos, registered trademarks or patents in this catalog shall not be construed to include the granting of licenses or rights of use. Their use is not permitted without the express written consent of HOERBIGER. The entire content of this catalog is the intellectual property of HOERBIGER. As defined by copyright, any unlawful use of intellectual property, including in extracts, is prohibited. Any full or partial reproduction, duplication or translation is only permitted with the prior written consent of HOERBIGER.