GRUNER

Technical data sheet

930U...
Electric Actuators for Butterfly Valves (Ingenious Series)

Product overview

The 930 Ingenious Series is a high-performance and innovative electric Butterfly valve actuator for V2...BV series Butterfly Valves, used as open/closed valves and control valves.

- 3.2-inches colour visual interface
- Independent non-contact electronic torque sensor with an accuracy of less than 5%, a settable percentage of protection torque, and a response time of 200 milliseconds
- Flexible and rich control applicability
- Intelligent power management
- Comprehensive condition diagnostics as well as optimal preventive maintenance
- Time-stamped event logs, operating statistics files, valve torque files
- Shock, battery, voltage, and temperature graphical trends

• Operating voltage	230 VAC / 380 VAC
• Control signals	Open/Close control Modulating control Communication Bus control
• Ingress protection	IP67 / IP68 (optional)
• Nominal angle of rotation	90°
• Manual Operation	Handwheel and 3D valve position indication
• Anti-condensation	Built-in anti-condensation heating element
• Explosion-proof rating	Optional Ex dIIBT4 ~ 6 or Ex dIICT4 ~ 6
• Bottom flange standard	ISO 5211

Multilingual Interface

Technical parameters

Electrical parameters	Operating voltage	230 VAC / 380 VAC
	Voltage tolerance	+/- 10%
	Frequency	50 / 60 Hz
	Current	See "Model Overview"
	Control signals	Jog/hold control, pulsed intermittent control On/off control: 2/3 point (SPDT). Modulating control: current/voltage Bus type control: Modbus/Profibus/HART
	Positional feedback	Auxiliary switch (2*SPDT), 250 VAC 5 A Programmable: 4–20 mA / 0(2)–10 VDC
	Cable glands	2-NPT3/4” 、Selectable：M20–M25、PG13.5、PG16、PT3/4“、PF3/4”
Performance parameters	Positioning time at 50 Hz, 90°	See "Model Overview"
	Rotation angle	90°±5°
	Location indication	360° viewing angle indication (explosion-proof type: continuous position indicator)
	Manual device	930U-230-60…600: Manual/automatic clutch mechanism 930U-230-800…8K: No clutch mechanism required
	Self-locking device	Turbine and worm mechanisms are provided
	Mechanical limits	Externally adjustable bolts
	Over-torque protection	Standard (except 930U-230-60…100).
	Anti-condensation device	Built-in moisture-proof heater
	Overheat protection	Built-in overtemperature protection, start-up temperature 120±5 °C
	Power-off status	Hold the position
	Off-signal status	4–20 mA/ 2–10 VDC: Fully open/fully close can be set 0–10 VDC: Close
Safety performance	Protection Class	III (safety extra-low voltage)
	EMC	CE (2014/30/EU)
	LVD	CE (2014/35/EU)
	Connecting flanges	ISO 5211
	Environmental compatibility	ISO 9001（Quality）
	Ambient temperature	-25–70 °C (can be customized)
	Ambient relative humidity	5–90 %, no condensation
	Ingress protection	IP67 / IP68 (optional)
	Maintenance	Maintenance-free
Size	Size	See "Dimensions"

Selection Instructions

Actuator	Type	Options	Controls	-	Power	-	Explosive-proof	Force	-	With
9	3	0	U	-	230	-	Ex	100	-	MB
9 = Butterfly valve actuators	1 = Exquisite collection Standard 2 = Classic series Advanced **3** = Ingenious series 7 = Pneumatic	**0** = No options	/ = 2/3-position (SPDT) **C** = 4...20mA 或 DC 0(2) – 10V **U** = Universal		**230** = 230 VAC **380** = 380 VAC		/ = No options Ex = Explosive-proof type	60 = 60 Nm 100 = 100 Nm 160 = 160 Nm 200 = 200 Nm 300 = 300 Nm 500 = 500 Nm 600 = 600 Nm 800 = 800 Nm 1K = 1000 Nm 1K3 = 1300 Nm 1K7 = 1700 Nm 2K = 2000 Nm 2K3 = 2300 Nm 3K5 = 3500 Nm 5K = 5000 Nm 8K = 8000 Nm		**MB** = Modbus **PB** = Profibus **HARD** = HARD

Model example:

930U-230-200 = Intelligent Electric Actuator, 200 Nm, Power Supply: 230 VAC

Model overview

Product model	Rated voltage/current	Control signals	Position feedback signal	50 Hz, 90° positioning time	Maximum output torque	Flange connection ISO 5211
930U-230-60	230 VAC/0.52 A	Switch/Regulation/Bus Type	2 x SPDT	27 s	60 Nm	F05–F07, sq 11
930U-230-100	230 VAC/0.52 A	Switch/Regulation/Bus Type	2 x SPDT	27 s	100 Nm	F05–F07, sq 14
930U-230-160	230 VAC/0.72 A	Switch/Regulation/Bus Type	2 x SPDT	28 s	160 Nm	F07–F10, sq 17
930U-230-200	230 VAC/0.72 A	Switch/Regulation/Bus Type	2 x SPDT	28 s	200 Nm	F07–F10, sq 17
930U-230-300	230 VAC/1.42 A	Switch/Regulation/Bus Type	2 x SPDT	32 s	300 Nm	F10–F12, sq 17
930U-230-500	230 VAC/1.38 A	Switch/Regulation/Bus Type	2 x SPDT	32 s	500 Nm	F10–F12, sq 22
930U-230-600	230 VAC/1.75 A	Switch/Regulation/Bus Type	2 x SPDT	32 s	600 Nm	F10–F12, sq 22
930U-230-800	230 VAC/1.75 A	Switch/Regulation/Bus Type	2 x SPDT	38 s	800 Nm	F12, sq 27
930U-230-1K	230 VAC/1.75 A	Switch/Regulation/Bus Type	2 x SPDT	43 s	1000 Nm	F12, sq 27
930U-230-1K3	230 VAC/1.75 A	Switch/Regulation/Bus Type	2 x SPDT	49 s	1300 Nm	F12, sq 27
930U-230-1K7	230 VAC/1.52 A	Switch/Regulation/Bus Type	2 x SPDT	34 s	1700 Nm	F14/F16, sq 36
930U-230-2K	230 VAC/1.52 A	Switch/Regulation/Bus Type	2 x SPDT	47 s	2000 Nm	F16, sq 36
930U-230-2K3	230 VAC/1.52 A	Switch/Regulation/Bus Type	2 x SPDT	47 s	2300 Nm	F16, sq 36
930U-230-3K5	230 VAC/1.52 A	Switch/Regulation/Bus Type	2 x SPDT	78 s	3500 Nm	F16, sq 46
930U-230-5K	230 VAC/1.52 A	Switch/Regulation/Bus Type	2 x SPDT	108 s	5000 Nm	F16, sq 46
930U-230-8K	230 VAC/1.52 A	Switch/Regulation/Bus Type	2 x SPDT	142 s	8000 Nm	F16–F25, sq 55

Device combinations

PN 16 Butterfly Valve	Actuators											
	930U-230-60	930U-230-100	930U-230-160	930U-230-200	930U-230-500	930U-230-800	930U-230-1K3	930U-230-1K7	930U-230-2K	930U-230-3K5	930U-230-5K	930U-230-8K
Butterfly valves	ΔPs [kPa]											
V2WABV.50	1600											
V2WABV.65	1600											
V2WABV.80	1600											
V2WABV.100	1600											
V2WABV.125		1600										
V2WABV.150			1600									
V2WABV.200			1600									
V2WABV.250					1600							
V2WABV.300					1600							
V2WABV.350						1600						
V2WABV.400						1600						
V2WABV.450							1600					
V2WABV.500								1600				
V2WABV.600									1600			
V2WABV.700										1000		
V2WABV.800											1000	

PN 16 Butterfly Valve	Actuators											
	930U-230-60	930U-230-100	930U-230-160	930U-230-200	930U-230-500	930U-230-800	930U-230-1K3	930U-230-1K7	930U-230-2K	930U-230-3K5	930U-230-5K	930U-230-8K
Butterfly valves	ΔPs [kPa]											
V2LABV.50	1600											
V2LABV.65	1600											
V2LABV.80	1600											
V2LABV.100	1600											
V2LABV.125		1600										
V2LABV.150			1600									
V2LABV.200			1600									
V2LABV.250					1600							
V2LABV.300					1600							
V2LABV.350						1600						
V2LABV.400						1600						
V2LABV.450							1600					
V2LABV.500								1600				
V2LABV.600									1600			
V2LABV.700										1000		
V2LABV.800											1000	

PN 16 Flanged Butterfly Valve	Actuators											
	930U-230-60	930U-230-100	930U-230-160	930U-230-200	930U-230-500	930U-230-800	930U-230-1K	930U-230-1K7	930U-230-2K	930U-230-3K5	930U-230-5K	930U-230-8K
Butterfly valves	ΔPs [kPa]											
V2DABV.50	1600											
V2DABV.65	1600											
V2DABV.80	1600											
V2DABV.100	1600											
V2DABV.125		1600										
V2DABV.150			1600									
V2DABV.200				1600								
V2DABV.250					1600							
V2DABV.300					1600							
V2DABV.350						1600						
V2DABV.400							1600					
V2DABV.450								1600				
V2DABV.500								1600				
V2DABV.600									1600			
V2DABV.700										1000		
V2DABV.800											1000	

DPs Refers to the maximum allowable differential pressure (closing differential pressure) at both ends of the valve under the condition that the electric Butterfly valve can be safely closed.

Functionality/Features

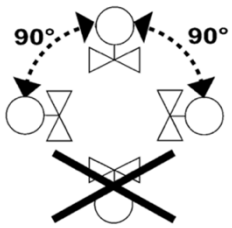
Mode of operation

- On/off control
- 3-point control
- Modulating control
- Manual control

The over-torque protection function will automatically trip when the valve is jammed to prevent further damage to the valve and actuator.
The motor overheat protection function ensures the safety of the motor.
Anti-condensation function, a heater is installed inside the actuator to remove the internal condensation damage to electrical components.

Direct installation

Actuators can be installed directly in V2: BV Butterfly valves, no special tools are required.
When the actuator is mounted on the valve, the Butterfly valve must be in the fully closed position "0%".
Mounting orientation: vertical to horizontal.



Indicates the signal

A mechanical 3D indicator shows the actuator's opening position, and an integrated auxiliary switch in the switching actuator triggers signal feedback when passing a fixed angle.

Manual operation

The actuator can be operated manually via the clutchless manipulator wheel integrated into the actuator body (note: the actuator can only be operated manually when the power is off).

Safety Precautions

Electrical installation

The electrical connection of the actuator must comply with the relevant local regulations (see "Electrical Wiring").

Commissioning and maintenance

Before the test run of the electric Butterfly valve, it is necessary to confirm that the wiring is correct and the parts are functionally intact.
To avoid pressure shocks on the Butterfly valve, before starting the pump, V2: The BV must be placed in a fully open position (either manually or via a control signal).
Before performing any maintenance on a valve or actuator, do the following:

- Turn off the pump and power
- Close the main shut-off valve in the pipeline
- Release the pressure on the pipes and allow them to cool completely

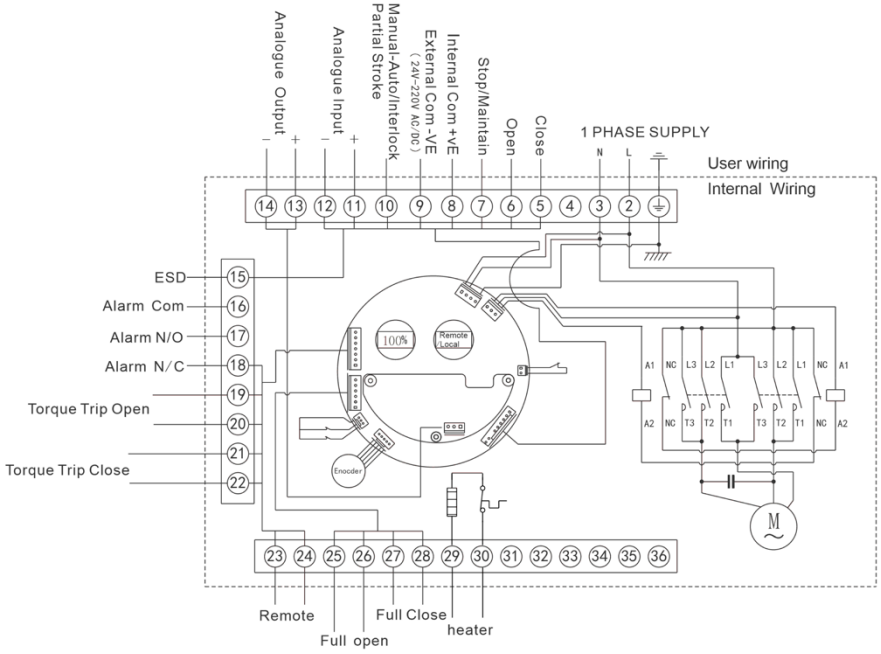
Disconnect the terminal blocks if needed.
Valves can only be commissioned after the correct installation of the handwheel, turbine or actuator.

Safety Matters

- The operation of this equipment must at all times comply with regulations and restrictions designed for the safety of persons and property!
- The device is not allowed to be used outside of the designated field of application, especially on board aircraft.
- The device should only be installed by properly trained personnel.
- The equipment installation process must comply with local laws and regulations or regulations issued by the authorities.
- Valves must comply with all local and currently applicable laws and regulations when disposed of at the end of life and are not allowed to be disposed of as household waste.
- By law, some parts may require special handling, as they may be harmful to the environment.

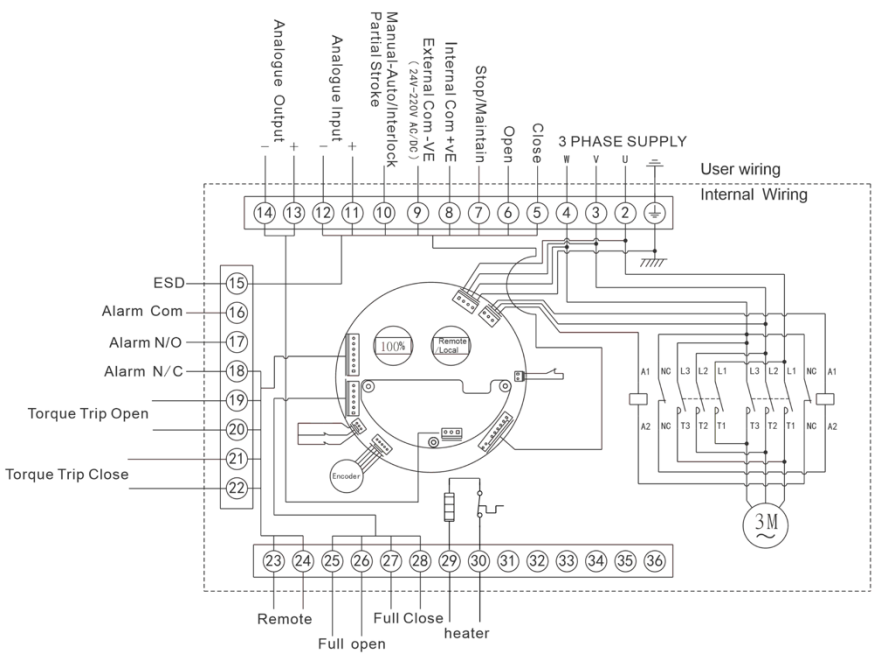
Electrical wiring

【 930U-230-60...8K，230 VAC 】



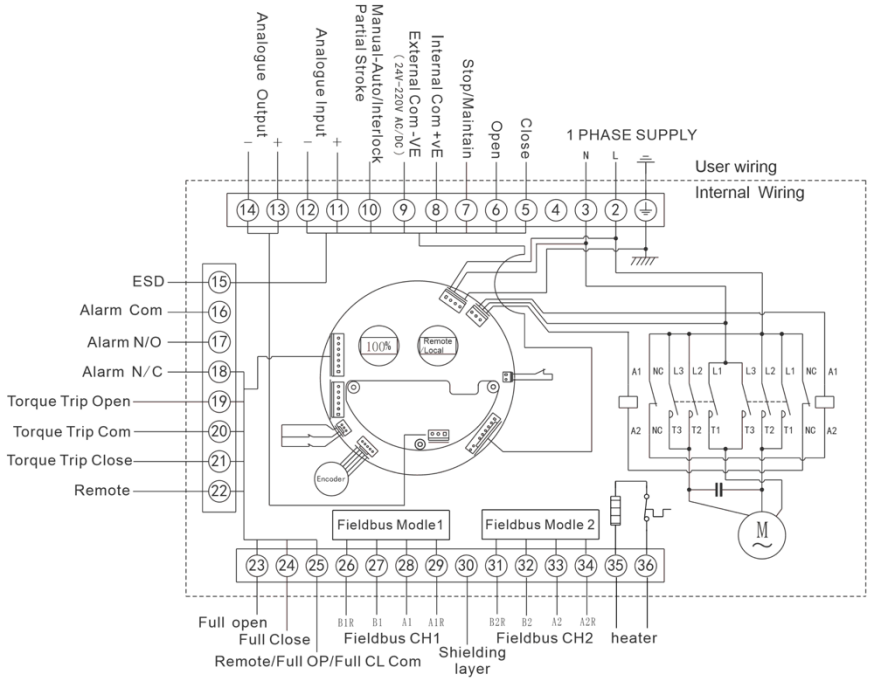
2	System Live Wire(L) 230 VAC
3	System Neutral (N)
5	Remotely close the valve
6	Remotely open the valve
7	Remotely hold/jog
8	Remote communication
9	Remote communication (24–230 VAC/DC)
10	Manual/auto/interlock switching
11	Control Signal +
12	Control Signal -
13	Position Feedback (Output)+
14	Position Feedback (Output) -
15	Remote ESD control
16	Alarm Signal Return
17	Comprehensive alarm normally open (disconnect when alarming)
18	Comprehensive alarm normally closed (closed when alarming)
19-20	Opening moment over torque (closed)
21-22	Closing moment over torque (closed)
23-24	Remote/local switching (remote closure)
25-26	Fully Open (closed contact)
27-28	Fully Closed (closed contact)
29-30	heater
⏚	earthing

【 930U-380-60...8K，380 VAC 】



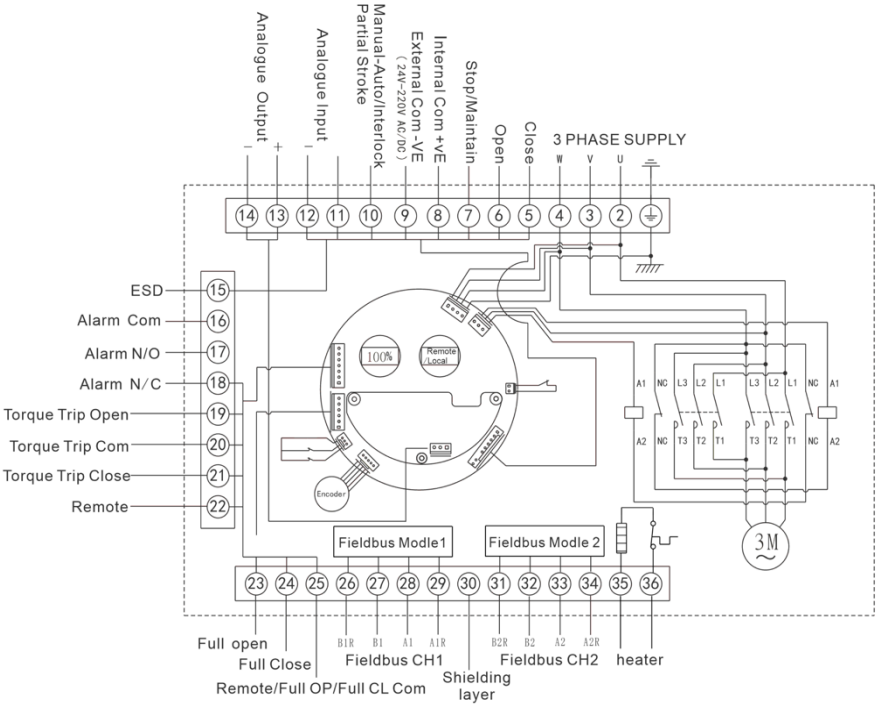
2	Three-phase power supply (U).
3	Three-phase power supply (V)
4	Three-phase power supply (W)
5	Remotely close the valve
6	Remotely open the valve
7	Remotely hold/jog
8	Remote communication
9	Remote communication (24–230 VAC/DC)
10	Manual/auto/interlock switching
11	Control Signal +
12	Control Signal -
13	Position Feedback (Output)+
14	Position Feedback (Output) -
15	Remote ESD control
16	Alarm Signal Return
17	Comprehensive alarm normally open end (disconnect when alarming)
18	Comprehensive alarm normally closed end (closed when alarmed)
19-20	Opening moment over torque (closed)
21-22	Closing moment over torque (closed)
23-24	Remote/local switching (remote closure)
25-26	Fully Open (closed contact)
27-28	Fully Closed (closed contact)
29-30	heater
⏚	Earthing

[930U-230-60...8K-MB/PB, 230 VAC, Profibus/Modbus bus wiring diagram]



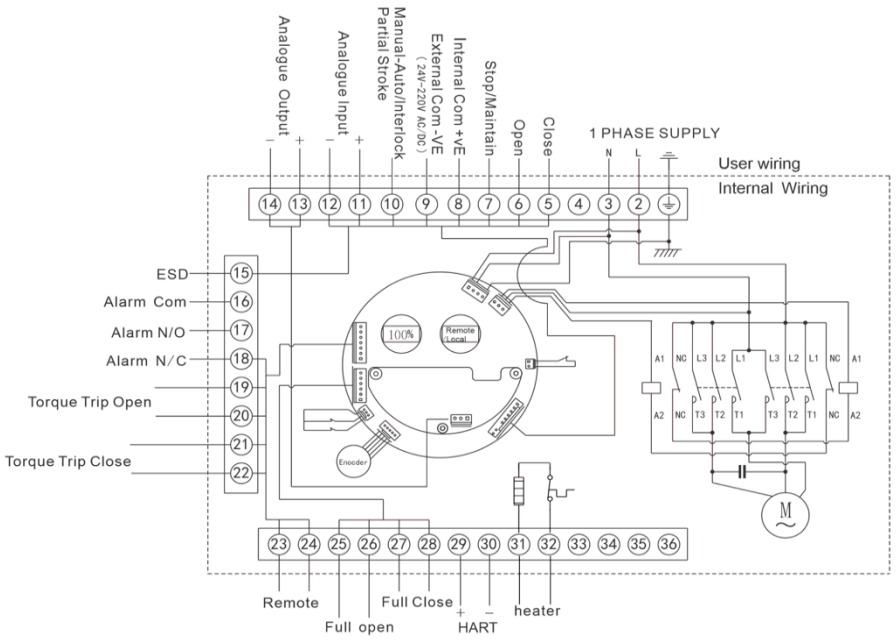
2	System Live Wire(L) 230 VAC
3	System Neutral (N)
5	Remotely close the valve
6	Remotely open the valve
7	Remotely hold/jog
8	Remote communication
9	Remote communication (24–230 VAC/DC)
10	Manual/auto/interlock switching
11	Control Signal +
12	Control Signal -
13	Position Feedback (Output)+
14	Position Feedback (Output) -
15	Remote ESD control
16	Alarm Signal Return
17	Comprehensive alarm normally open (disconnect when alarming)
18	Comprehensive alarm normally closed (closed when alarming)
19	Opening moment over torque (closed)
20	Signal Return
21	Closing moment over torque (closed)
22	Remote/local switching
23	Fully Open
24	Fully Closed
25	Remote/local, Signal return
26-29	Bus channel 1
30	Shielding
31-34	Bus channel 2
35-36	heater
⏚	earthing

[930U-380-60...8K-MB/PB, 380 VAC, Profibus/Modbus bus wiring diagram]



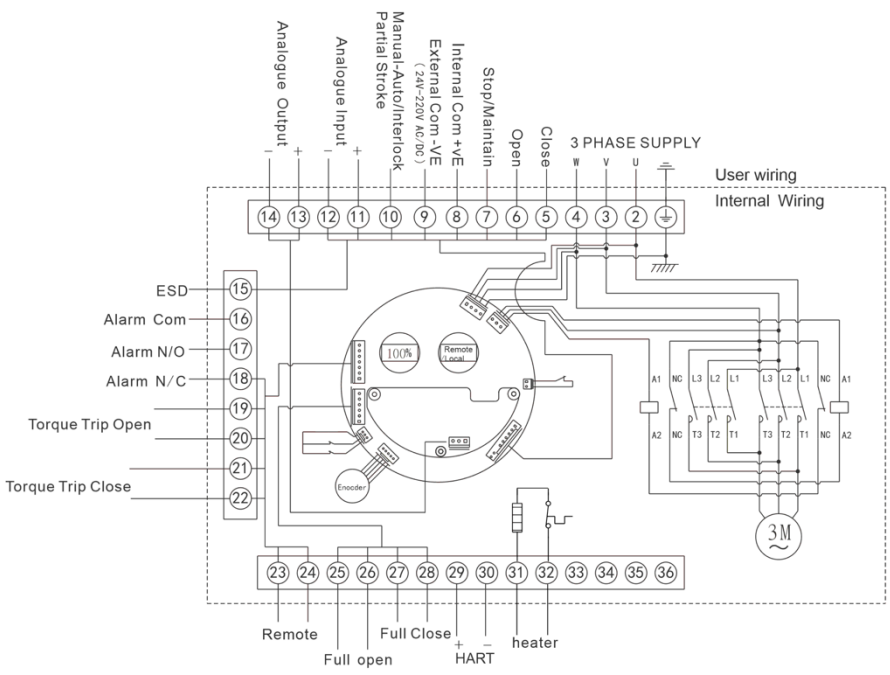
2	Three-phase power supply (U)
3	Three-phase power supply (V)
4	Three-phase power supply (W)
5	Remotely close the valve
6	Remotely open the valve
7	Remote hold/jog
8	Remote communication
9	Remote communication (24–230 VAC/DC)
10	Manual/auto/interlock switching
11	Control Signal +
12	Control Signal -
13	Position Feedback (Output)+
14	Position Feedback (Output) -
15	Remote ESD control
16	Alarm Signal Return
17	Comprehensive alarm normally open end (disconnect when alarming)
18	Comprehensive alarm normally closed end (closed when alarmed)
19	Opening moment over torque (closed)
20	Signal Return
21	Closing moment over torque (closed)
22	Remote/local switching
23	Fully Open
24	Fully Closed
25	Remote/local, Signal return
26-29	Bus channel 1
30	Shielding
31-34	Bus channel 2
35-36	heater
⏚	earthing

【 930U-230-60...8K-HART，230 VAC， HART wiring diagram 】



2	System Live Wire(L) 230 VAC
3	System Neutral (N)
5	Remotely close the valve
6	Remotely open the valve
7	Remote hold/jog
8	Remote communication
9	Remote communication (24–230 VAC/DC)
10	Manual/auto/interlock switching
11	Control Signal +
12	Control Signal -
13	Position Feedback (Output)+
14	Position Feedback (Output) -
15	Remote ESD control
16	Alarm Signal Return
17	Comprehensive alarm normally open end (disconnect when alarming)
18	Comprehensive alarm normally closed end (closed when alarmed)
19-20	Opening moment over torque (closed)
21-22	Closing moment over torque (closed)
23-24	Remote/local switching (remote closure)
25-26	Fully Open (closed contact)
27-28	Fully Closed (closed contact)
29	HART communication interface +
30	HART communication interface -
31-32	heater
⏚	earthing

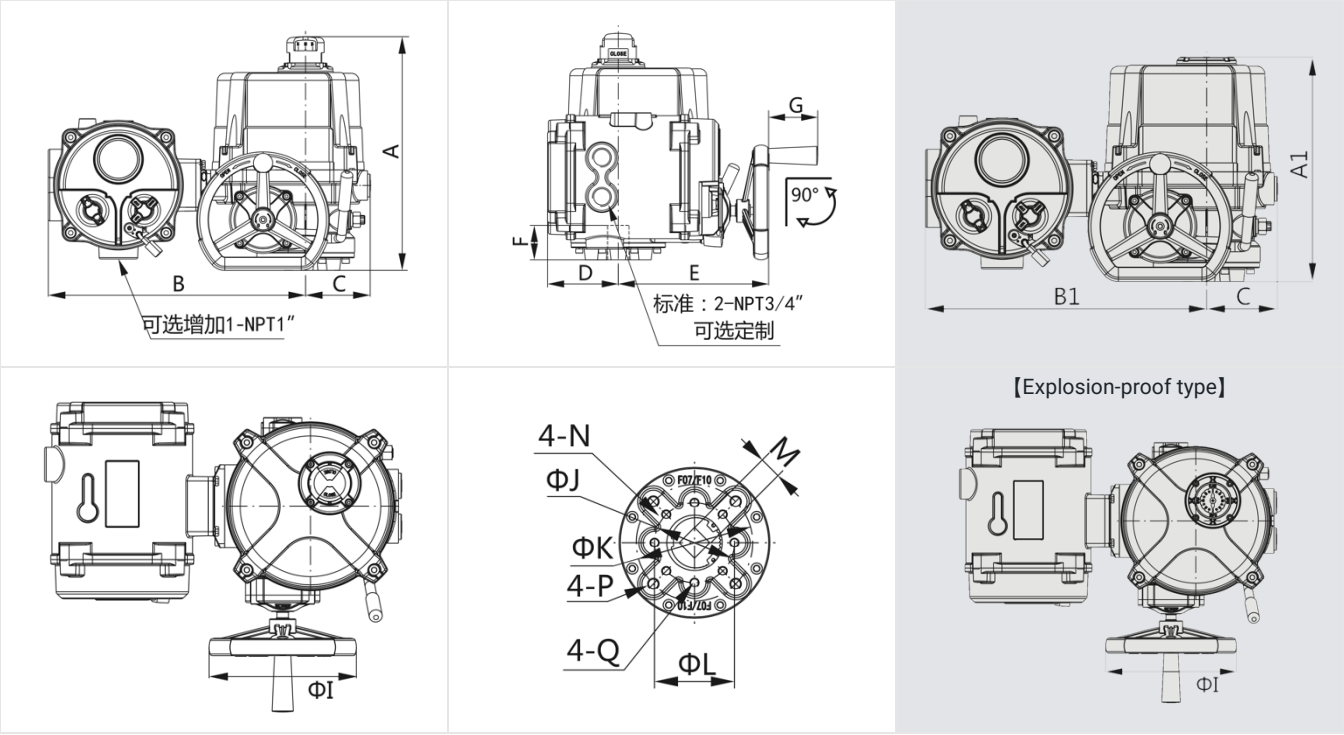
【 930U-380-60...8K-HART，380 VAC，HART wiring diagram 】



2	Three-phase power supply (U)
3	Three-phase power supply (V)
4	Three-phase power supply (W)
5	Remotely close the valve
6	Remotely open the valve
7	Remotely hold/jog
8	Remote communication
9	Remote communication (24–230 VAC/DC)
10	Manual/auto/interlock switching
11	Control Signal +
12	Control Signal -
13	Position Feedback (Output)+
14	Position Feedback (Output) -
15	Remote ESD control
16	Alarm Signal Return
17	Comprehensive alarm normally open end (disconnect when alarming)
18	Comprehensive alarm normally closed end (closed when alarmed)
19-20	Opening moment over torque (closed)
21-22	Closing moment over torque (closed)
23-24	Remote/local switching (remote closure).
25-26	Fully Open (closed contact)
27-28	Fully Closed (closed contact)
29	HART communication interface +
30	HART communication interface -
31-32	heater
⏚	earthing

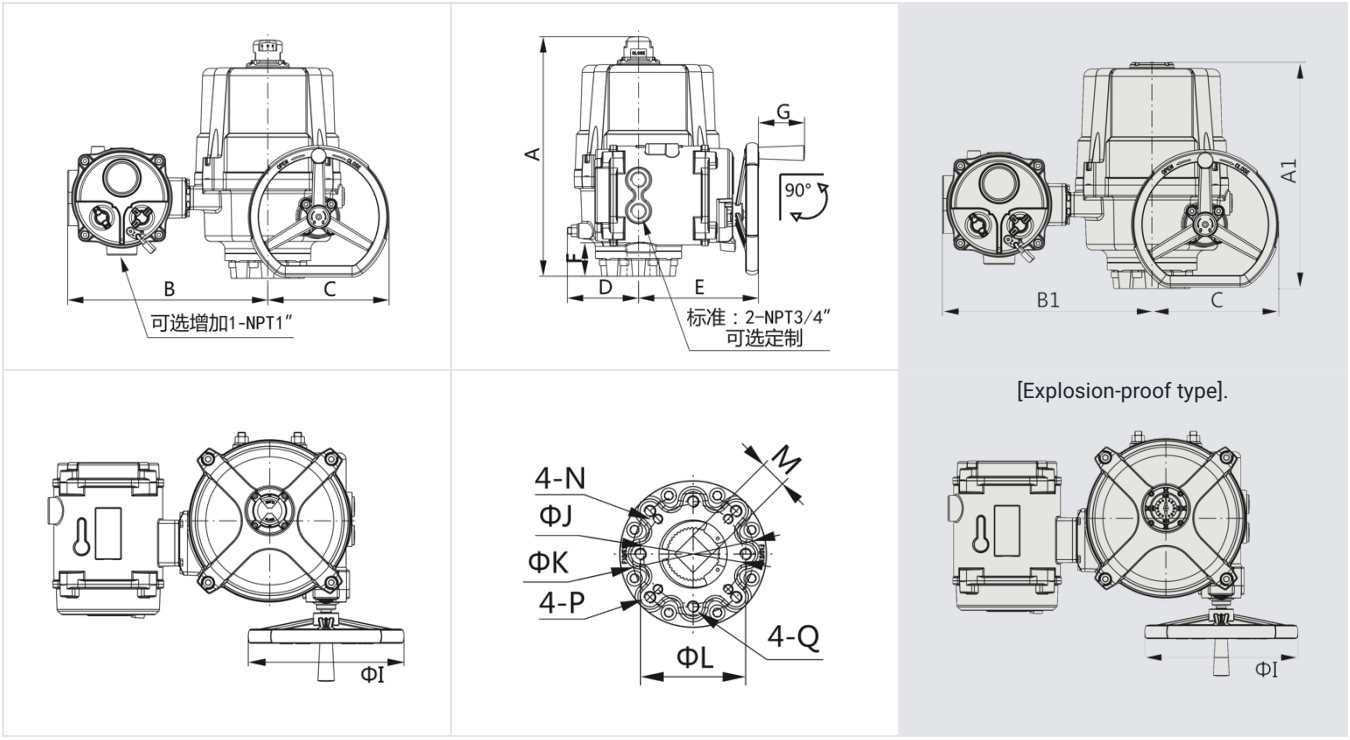
Size

【 930U-230/380-60...600】



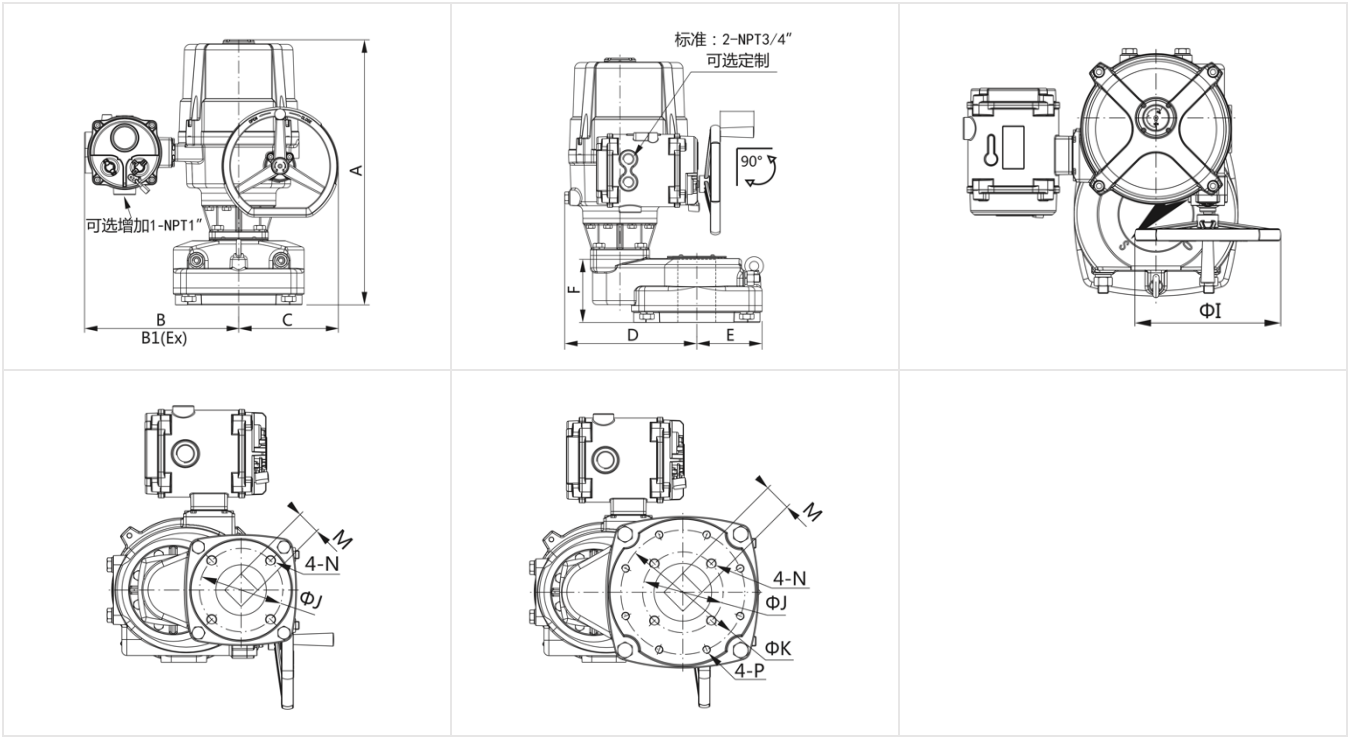
Model	A	B	C	D	And	F	G	Ø I	Ø J	4 - N	Ø K	4 - P	Ø L	4 - Q	M	A1	B1	Weight (kg)
930U-...-60	280	300	77	95	171	40	50	100	50	4-M6	70	4-M8	57.15	4-M6	9/**11**/14/17	240	312	6.9
930U-...-100	280	300	77	95	171	40	50	100	50	4-M6	70	4-M8	57.15	4-M6	9/11/**14**/17	240	312	6.9
930U-...-160	316	336	90	99	208	48	63	180	70	4-M8	102	4-M10	69.85	4-M8	11/14/**17**/22	276	348	16.4
930U-...-200	316	336	90	99	208	48	63	180	70	4-M8	102	4-M10	69.85	4-M8	11/14/**17**/22	276	348	16.4
930U-...-300	341	346	98	93	218	52	63	180	102	4-M10	125	4-M12	88.9	4-M12	14/**17**/22	301	358	20.5
930U-...-500	341	346	98	93	218	52	63	180	102	4-M10	125	4-M12	88.9	4-M12	14/17/**22**	301	358	20.5
930U-...-600	341	346	98	93	218	52	63	180	102	4-M10	125	4-M12	88.9	4-M12	14/17/**22**	301	358	20.5

【930U-230/380-800...2K3】



Model	A	B	C	D	And	F	G	Ø I	Ø J	4 - N	Ø K	4 - P	Ø L	4 - Q	M	A1	B1	Weight (kg)
930U-...-800	415	338	212	128	208	58	80	250			F10-F12 / F14				17 / 22 / **27**	375	350	33.4
930U-...-1K	415	338	212	128	208	58	80	250			F10-F12 / F14				17 / 22 / **27**	375	350	33.4
930U-...-1K3	415	338	212	128	208	58	80	250			F10-F12 / F14				17 / 22 / **27**	375	350	33.4
930U-...-1K7	458	353	236	146	236	66	80	280			F12 / F14 / **F16**				22 / 27 / **36**	418	365	44
930U-...-2K	458	353	236	146	236	66	80	280			F12 / F14 / **F16**				22 / 27 / **36**	418	365	44
930U-...-2K3	458	353	236	146	236	66	80	280			F12 / F14 / **F16**				22 / 27 / **36**	418	365	44

【 930U-230/380-3K5...8K 】



Model	A	B	C	D	And	F	G	Ø I	Ø J	4 - N	Ø K	4 - P	M	B1 (Ex)	Weight (kg)
930U-...-3K5	620	353	236	267	110	145	80	280	165	4-M20	F14 / **F16**		36 / **46**	365	80
930U-...-5K	620	353	236	267	110	145	80	280	165	4-M20	F14 / **F16**		36 / **46**	365	80
930U-...-8K	627	353	236	315	155	150	80	280	165	4-M20	F16 / **F25**		46 / **55**	365	107