WONDER HC Actuator®

Multi-turn and Part-turn

WONDER®

Light Years Ahead

WONDER HC Actuator®

Choose Open Protocol for Smart Control

Considering the ongoing advancements in communication and hardware technologies, the complexity of MOV (Motor-Operated Valve) actuators has significantly decreased. Choosing an MOV actuator that adheres to an open protocol is a wise and intelligent decision. By carefully considering the technical aspects and avoiding any private protocols mentioned in your inquiry, you position yourself as an empowered end-user in full control.

Discover Wonder HC Actuator®

Wonder HC Actuator® is purpose-built to empower end-users like you, providing a MOV solution that shields your plant from the pitfalls of high costs, dependence on a single manufacturer, elevated maintenance expenses, and subpar post-sales service.

Versatile Compatibility

Our system is designed with an OPEN protocol, ensuring full compatibility with various communication standards, including Modbus RS485, Foundation Fieldbus, PROFIBUS, and 4-20mA.

Advantages

Improved Technical Functions

We offer ON/OFF control function with built in control (4-20mA / 0-100% analog control) and support up to 3-phase/stage closing with three timer setting combinations to prevent the hammer effect.

Cost Effective

It not only offers cost-competitive solutions for new installations but also proves to be an economical choice for ongoing maintenance servicing.

Local Support at Your Fingertips

We provide local support right at your doorstep. Our local service team focuses on every single unit, conducting field measurements on the valve stem thread and customizing the coupling adapter to address field challenges, ensuring compatibility with any valves you are using.

Our 12,000 ft² MOV integration, testing, and service center is fully audited by IECEx auditors.

Field Proven Reliability

Our system has been field-proven in Singapore, Malaysia, and Thailand, working seamlessly with Emerson, Honeywell, and Yokogawa DCS systems based on various communication protocols. With over 20,000 installations across Asia.

Rapid Response Master Station

RS 485-based Master Station boasts fast response times, offering connectivity to either up to four ring-loops or two redundant ring loops, supporting up to 120 units per ring loop. A redundant master station ensures hot-swappable capabilities. Plus, our long-distance communication loop maintains high baud rates of 9600 or 19200, significantly outpacing Current Loop communication, which operates at slower baud rates of 2400 or 1200.

Regulatory Compliance

- IEC 61508 Parts 1-7:2010 : SIL 2 and SC3 acc. To and can be used in applications up to SIL2 with a HFT=0 and in redundant structures up to SIL3 according to IEC 61508 /IEC 61511.
- EN60079-0/1/31: EX II 2 G Exd IIC T4 Gb / EX II 2D EX tb IIIC T130°C Db IP68 (2m, 48hrs).

Comprehensive Services Offered

We offer complete valve, actuator integration and testing services, fireproof jackets, and customized coupling adaptors in our state-of-the-art facility. Our commitment to quality and performance ensures that your MOV works seamlessly from the start.

Try Before You Buy

Interested in a trial run for your specific application? Trial units are readily available for testing in your specific application. We offer trial units to ensure our solution meets your unique needs.

Get in touch with us today!

WONDER HC Actuators® Range

WONDER HC-MT

- **Versatile Application:** Ideal for both on-off and control applications, suitable for gate valves and globe valves.
- **Impressive Torque Range:** Offers a torque range from 40 Nm to 3,000 Nm, extendable up to 50,000 Nm when equipped with a gear box.
- **Variable Output Speed:** The actuator provides a flexible output speed ranging from 8 to 144 rpm.

WONDER HC-LS

- **Ideal for Control Valves:** Tailored for control valves, ensuring precise control.
- **Impressive Thrust Range:** Offers a thrust scope ranging from 1 kN to 100 kN, making it suitable for various applications.
- **Customizable Travel:** The actuator's maximum travel can extend up to 250mm, with customization options available to meet specific requirements.
- **Variable Linear Speed:** Provides a flexible linear speed ranging from 1.6 to 6.4 mm/sec, enabling precise control of valve movements.

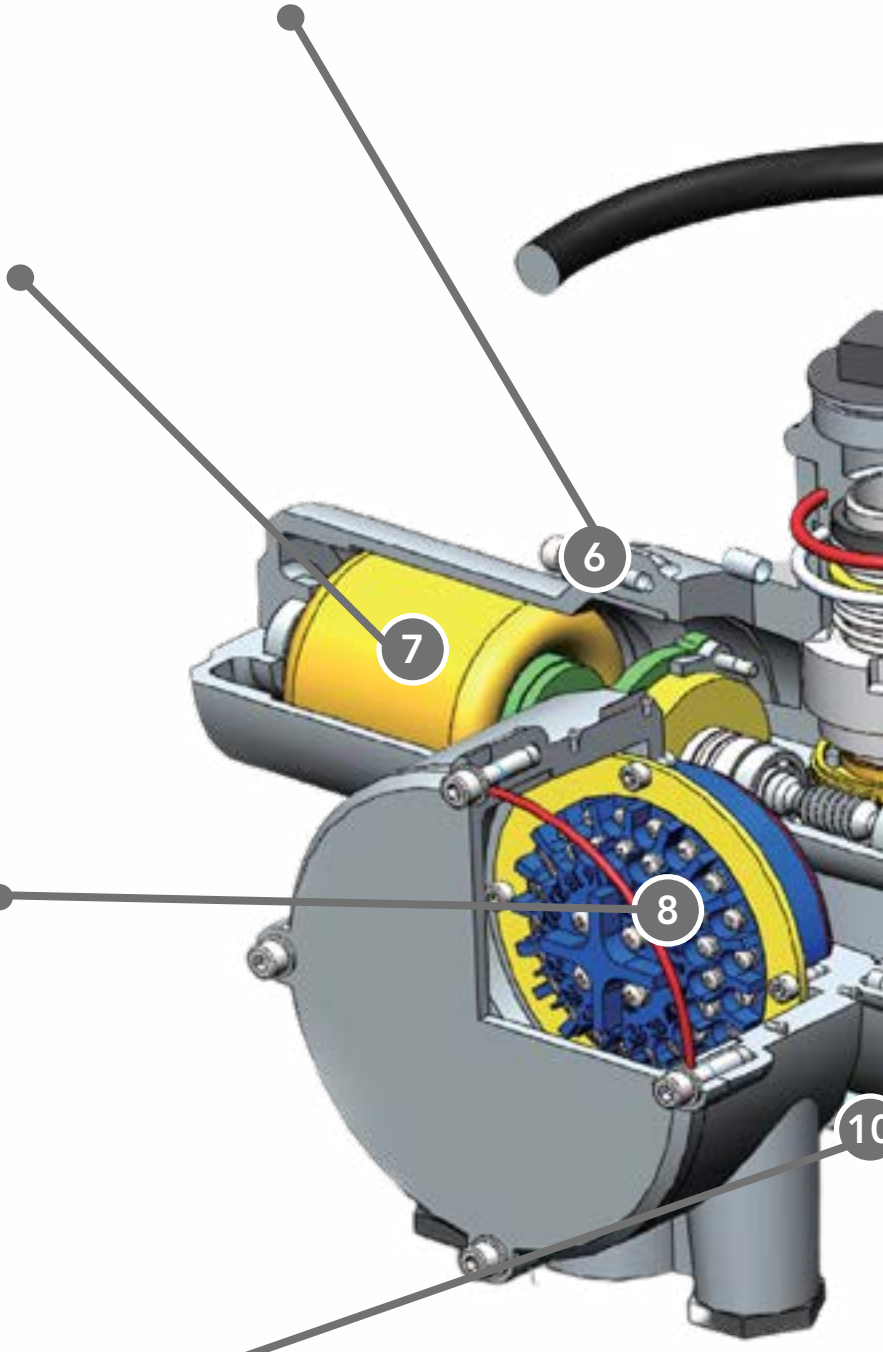
WONDER HC-PT

- **Versatile Application:** Suitable for both on-off and control applications, compatible with butterfly valves, ball valves, and plug valves.
- **Wide Torque Range:** Comes with a torque range, including gearbox, from 40 Nm to 500,000 Nm, ensuring it meets the demands of various tasks.
- **Integrated Design:** For lower torque requirements, there is an integrated option with a torque range of 20 Nm to 2,000 Nm

Design Features

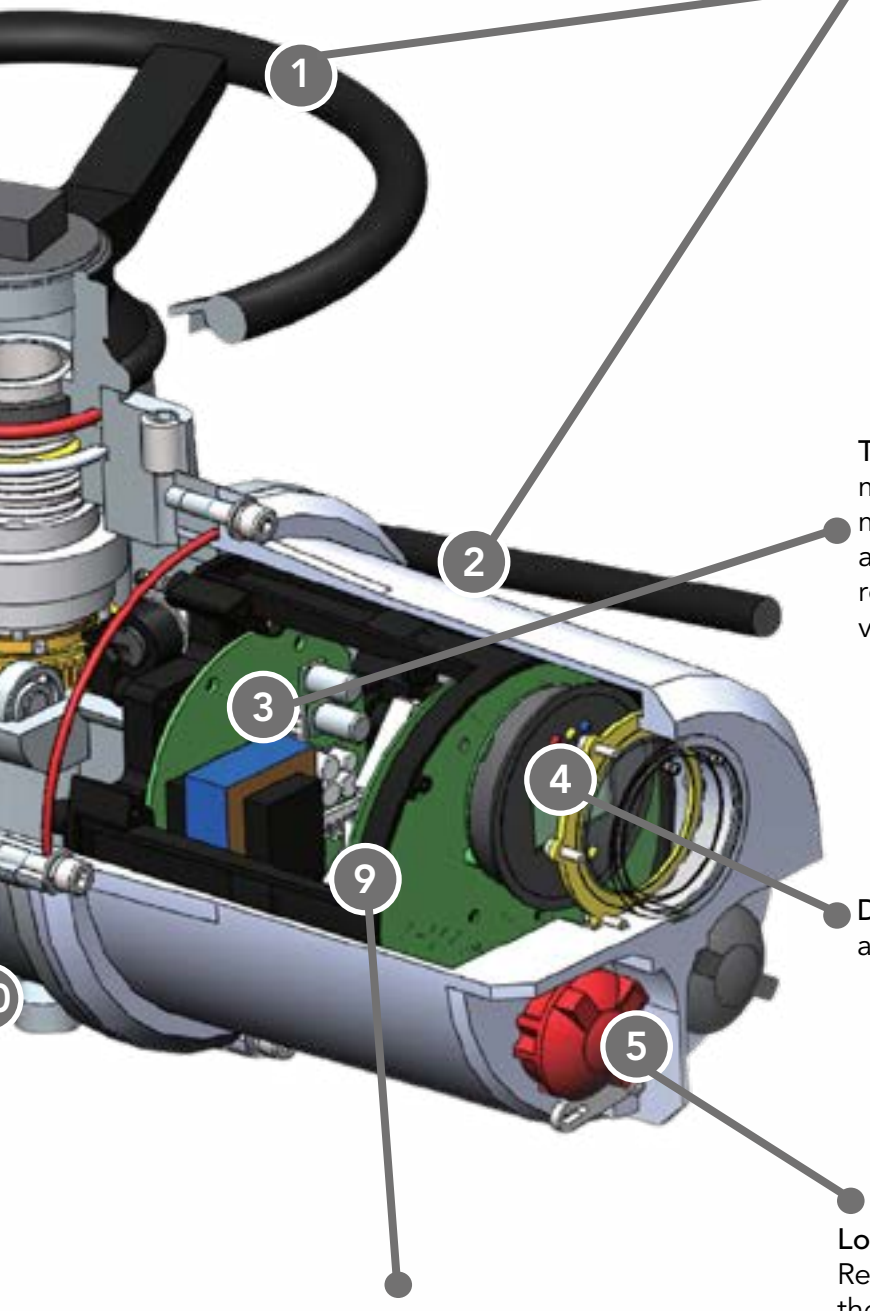
Enclosure: Explosion-Proof, with protective coating.

Low inertia, high-speed motor: can quickly reach peak torque after startup, with no overspeed motion. Precision temperature switches are integrated within the motor coils, unaffected by ambient temperatures, ensuring the motor operates at optimal thermal capacity. the motor shaft and worm gear are independent of each other for easy replacements.



Double Sealed terminal compartment: The Terminal Chamber is separated from the control Chamber which is to ensure the actuator enclosure being completely sealed.

Coupling Adaptor: Easily detachable without affecting the valve's position, and readily customizable to match the valve stem thread.



Handwheel: Direct-Drive and geared handwheel for manual operation of the valve.

Torque Sensor: the output torque measurement is based on electrical power measurement technology, providing precise and repeatable torque measurement values that remain independent of variations in frequency, voltage, and temperature.

Display: Wide viewing window with detail actuator status and configuration setting details.

Local Controls: Open/Close and Local/Stop Remote selectors are magnetically coupled to the solid state switches inside the cover. This along with double-sealing, futher enhances the non-instructive protection of the actuator.

CPU Board: consists of control, monitoring, and protection modules, featuring a plug-and-play design with shock absorption and easy disassembly for replacement.

Design Features

Phase Sequence Protection

By utilizing phase synchronization technology, users are relieved from the need to consider the phase sequence of three-phase alternating current during the actuator's wire connection installation. This always ensures the correct power supply phase sequence for the three-phase electric motor.

Motor Protection

A three-phase motor can overheat and burn out when it operates with any a phase loss or overload, leading to a rapid current increase. The motor protection mechanism continuously monitors the motor's operation and the three-phase power supply. If it detects phase loss, overcurrent, or overload, it immediately cuts the power and triggers alarms on the LCD interface and in the control room.

Valve Stuck Protection

While opening or closing the valve, the torque protection function remains inactive for a set period (3 to 10 seconds). The actuator persists in its effort to operate the valve. If the valve remains stuck beyond this time, the power supply will be automatically disconnected, triggering a fault alarm.

Electromagnetic Interference Protection

Using optoelectronic isolation technology for all input/output channels, it can withstand ±2kV transient pulse interference and 4kV electrostatic discharge impacts. The signal end handles 6kV/3kA surge impacts, and the power supply end withstands 20kV/10kA surge impacts, ensuring robust resistance to electromagnetic interference.

Torque Protection

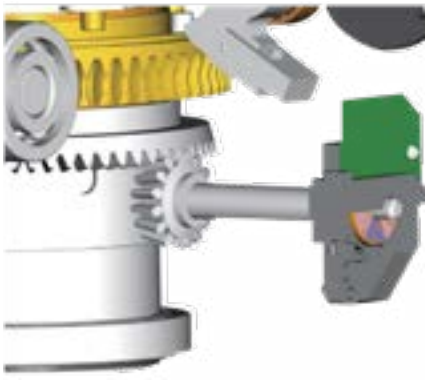
Users can configure over-torque protection values for both closing and opening directions. When the actuator's actual torque surpasses the set protection value, the motor will shut down and trigger a fault alarm.

Transient reverse protection

Upon receiving a transient reverse signal, the actuator automatically introduces a delay to prevent unnecessary wear and tear on valve components, preserving both the valve and the actuator. Users can adjust the delay time via the LCD interface (ranging from 0.1 to 9.9 seconds).

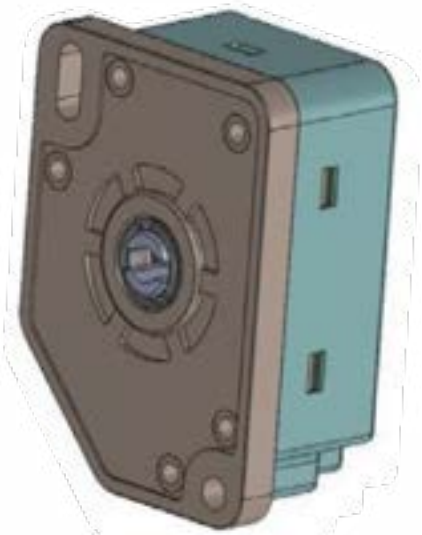
Hall Coding Technology

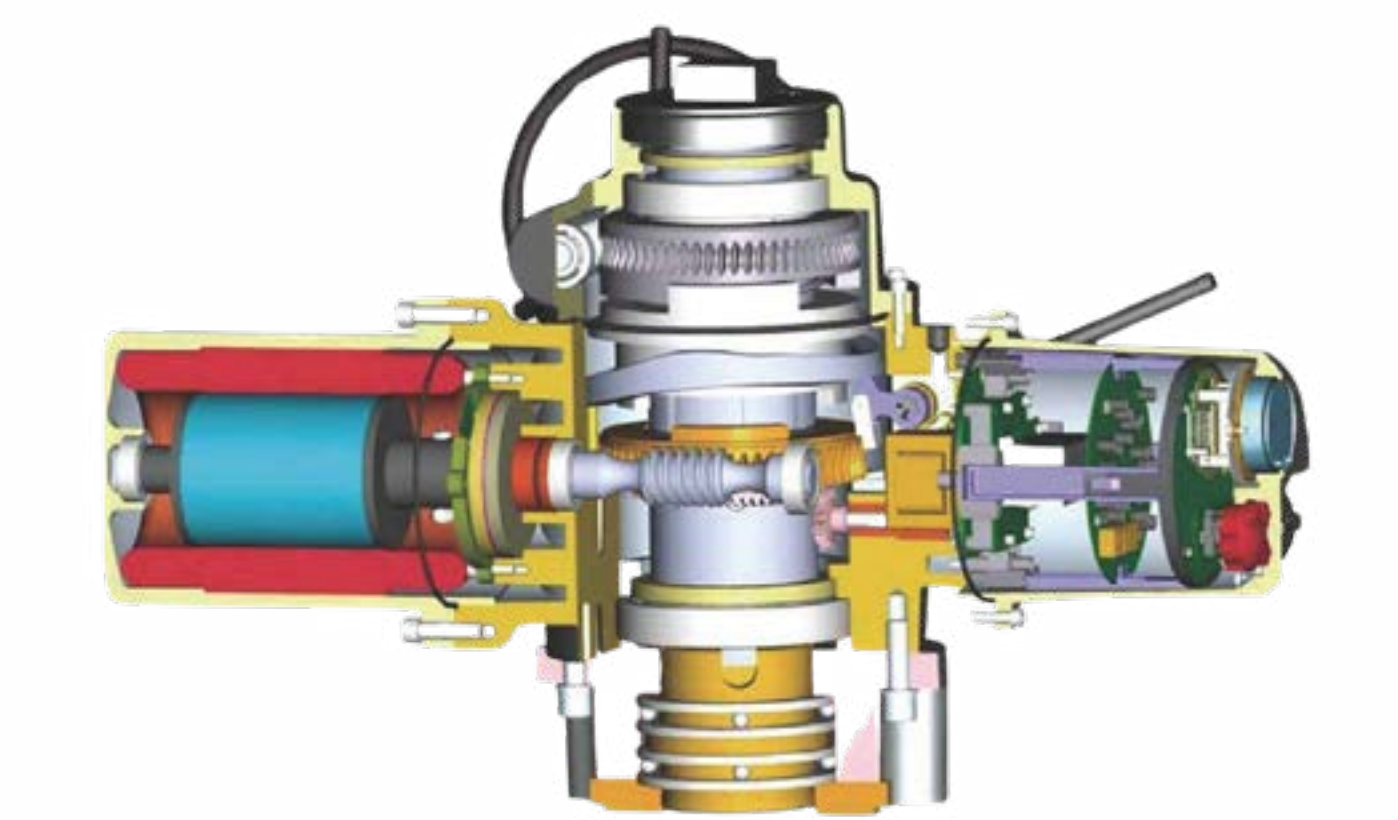
- When the output shaft rotates, a pair of bevel gears are simultaneously driven, and a six-antipode magnetic ring is installed at the end of the bevel gear.
- Two Hall elements, positioned 90 degrees apart, encircle the magnetic ring, generating a pulse signal by detecting changes in the magnetic field. This signal accurately captures parameters like displacement, rotation direction, and speed. Position determination is continuous, recording every change.
- It precisely determines rotation direction, valve position, and changes in position.
- It operates reliably with high measurement accuracy and robust resistance to interference, unaffected by external temperature changes.
- Contactless data sampling ensures a long service life without wear.



Absolute Coding Technology

- When the output shaft rotates, a pair of bevel gears are simultaneously driven, with a six-antipode magnetic ring installed.
- It provides uninterrupted and 100% repeatable position information, independent of a power supply.
- Single-ring encoding features 12-bit counting with 0.08° accuracy.
- Multi-ring encoding employs 6-stage gear counting, allowing a maximum of 4096 counting circles (unique values within a 4096-circle rotation of the driving sleeve).
- Redundant encoder circuits.





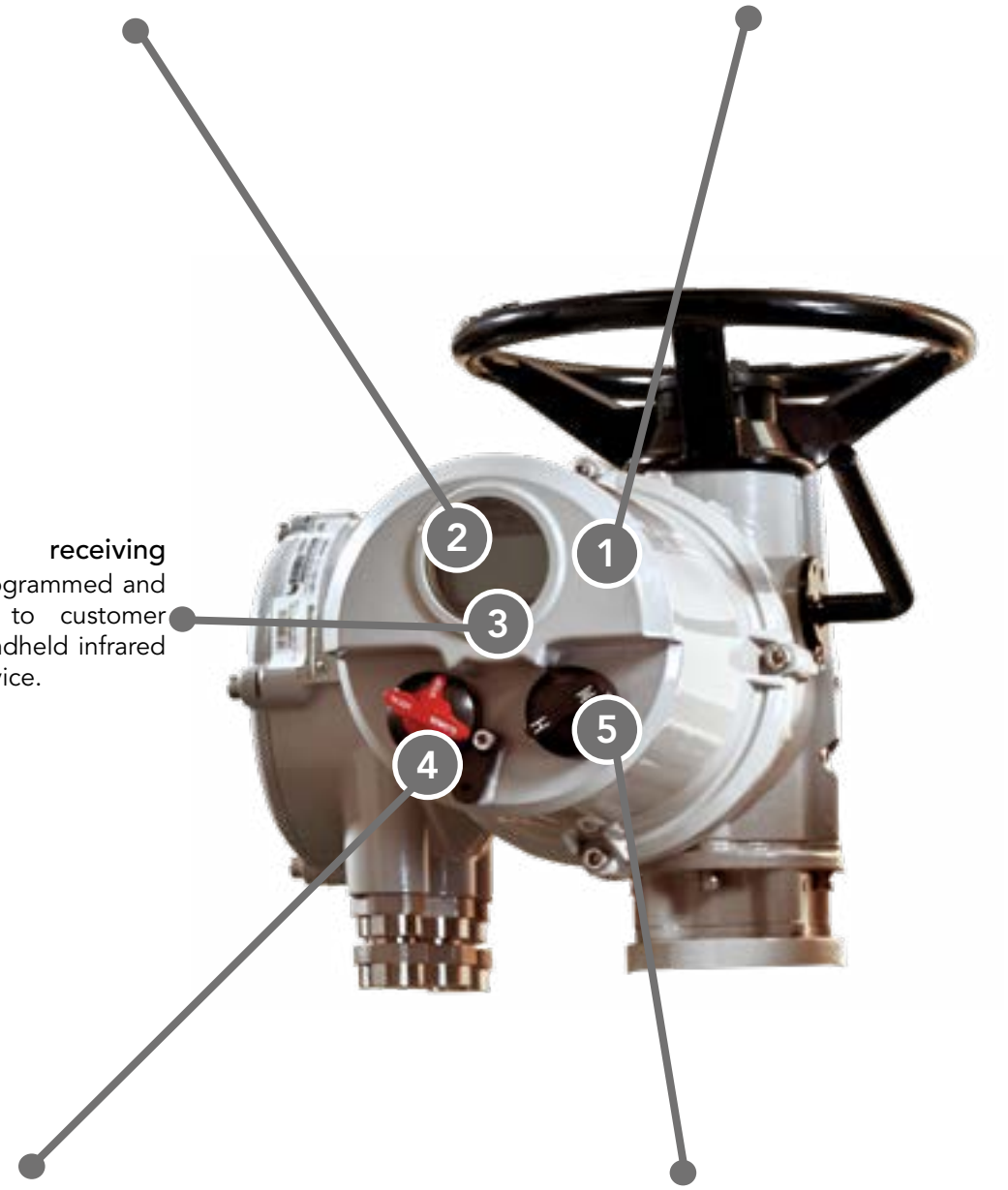
Electric Torque Detection

- Replacing traditional mechanical torque switch.
- Cut-off torque can be independently set at 1% of the step length in both forward and reverse directions.
- The electric torque detection device includes an effective power detection circuit, an electric motor angular speed detection circuit, a control circuit, and a CPU microprocessor.
- The microprocessor continuously detects effective power and angular speed, calculating actual torque for comparison with the preset cut-off torque. If the actual torque exceeds the preset value, the CPU immediately cuts off the electric motor's power supply and triggers a failure alarm, ensuring protection against over-torque, preventing motor burnout, and valve damage.
- Contactless torque detection eliminates the need for a mechanical torque switch, saving maintenance efforts and extending the service life.
- It remains unaffected by factors such as temperature and voltage fluctuations, providing reliable protection for field valves.

Display Panel

Indicator: Serving as a visual signal for displaying the actuator's status, the indicator boasts exceptional visibility in harsh environments. The LED indicator remains clear and recognizable, even during the night and at significant distances.

LCD Interface: The LCD interface is thoughtfully designed to align with users' visual and operational preferences, displaying torque, valve opening, limit settings, and failure alarm information in both textual and graphical formats.



Infrared/Bluetooth receiving Window: It can be programmed and configured according to customer preferences using a handheld infrared or Bluetooth setting device.

Selection of Control Mode: The selective switch, labeled 'remote,' 'halted,' and 'local,' on the local operating device provides options for remote operation (remote control from Distributed Control System (DCS), local operation (local control), or a halted mode.

Local Electric Operation: The operating switch, with 'on' and 'off' settings, on the local operating device allows for easy local opening and closing of the actuator.

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Technical Specifications

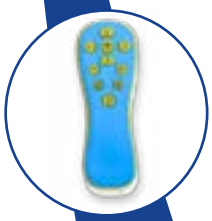
Overall specification	Torque range	Multi-turn Torque: 40-3,000Nm With gear box: Max. 50,000N.m	Part-turn Torque: 40-1000Nm With gear box: Max. 500,000Nm
	Control type	• On/Off, Regulating, Fieldbus	
	Exclosure material	• Aluminium casting • HC-D180/HC-D250/HC-D300 adopts nodular cast iron	
Exclosure protection	Rating	• IP68	
	Operating Temperature	• Standard: -30...+70°C • Low temperature: -50...+70°C • High temperature: -30....+150°C	
	Corrosion protection	• Standard coating • Special anti-corrosion protection used in ocean and chemical engineering corrosion environment can be selected • All the fastening bolts on the end cover adopt stainless steel bolt	
	Double seal protection	• The control section of actuator is completely separated from the connection box so as to protect the electronic components	
	Explosion proof grade	• Exd II BT4/CT4	
Motor	Motor technical	• Fully sealed the air-cooled squirrel-cage motor (ac) • Insulation class F(H can be customized) • Built-in overheating protection • shielded ball bearing in front and back,easy to dismount	
	Motor working system	• S4 Motor by standard IEC34-1 (periodic start and electric braking) • Short-time duty: used for on/off operation,rated operation time 15min • S5-50%: used for adjustment operation-maximum boot times are 1200/hour	
Mechanical specification	Gear drive	• Self-locking can be realized at all speeds	
	Hand wheel	• The hand wheel doesn't rotate along with the electric operation • Automatic separation and reunion of hand wheel can be realized without manual operation	
	Output flange	• The flange of multi-turn actuator conforms to ISO 5210 standard • The flange of quarter-turn actuator conforms to ISO 5211 standard • Special flange is optional for top size of valve	
	Output shaft	• Adopt dismountable sleeve • Large torque quarter-turn gear box: processing 1/4 segment directly	
	Lubrication	• The lubrication of actuator is effective along the whole service life and there is no need for special regular maintenance	
Electric specification	Power supply	• Multiple Power supply can be selected: • Three Phase or Single Phase • Maximum 690V • 50Hz or 60Hz	
	Cable inlet	Standard configuration: • Ordinary type: 1 M42*2 and 2 M28*1.5 • Explosion proof type: 1 NPT 1.5N" and 2 NPT 1N" (redundant bus can be increased to 3) • Sunflower terminal disk • Internal and external grounding terminal	
	Fusing protection	• Self-recovery fuse	
	Insulation properties	• The insulation resistance between the input terminal and the shell shall not be lower than 20MΩ • The insulation resistance between the input terminal and the power supply terminal shall not be lower than 50Ω • The insulation resistance between the power supply terminal and the shell shall not be lower than 50MΩ	

Sensor	Location Sensor	• Measure movement on the main shaft directly (direct mechanical connection) • Hall relative coding technology or absolute coding technology • Measurement range: 1.5-4096 circles of rotation of drive sleeve
	Torque Sensor	• Detect torque by measuring the useful power and motor current of three-phase power supply. • Set the range:40%-120% of actuator rated torque • Measuring range:10%-100% of the actuator torque
Power, Control & Indication	Motor Control	• Integrated motor reversing starter (AC contactor or Solid State Relay), automatically identify the power phase.
	Display	• LCD display with back-light
	Switch remote control	Control command: • Voltage: 10-36VDC/60-250VAC • Dry contact (using the 24VDC auxiliary power supply inside the actuator) • Isolate with photoelectric coupler • Minimum pulse interval: 30ms • Rotation reversing time: 1s (factory setting range: 1-10s)
	Signal relay	• 4 relays: output can be selected among 27 information • Contact configuration: normally open or normally close • Minimum current: 40mA for 5V • Maximum current: 5A for 250 VAC or 5A for 30 VDC (inductive load) • Relay board is optional
	Supervisor relay	• Normally close, live part, SPDT contact • Minimum current: 10mA for 5V • Maximum current: 5A for 250VAC or 5A for 30VDC (inductive load)
	Proportional control adjustment	• Input (setting) and output (feedback) signals are completely separated Signal setup (optional) • Input signal: 4-20mA Output signal: 4-20mA • Input signal: 0-10V Output signal: 0-20mA (0-10V with external resistance) Analog input • Current: Impedance 250Ω Analog output • Current: Maximum acceptable load under 24VDC is 750Ω • Basic error: ±1% • Return difference:≤1% • Dead zone: 0.5%-10.0% adjustable • Damping characteristics: No oscillation
	Signal battery	• Used to display and update switch position information (through signal relay) during power failure
Setup	Setup	• Non-intrusive infrared/bluetooth communication setup • All the actuator setup and parameter are stored in a nonvolatile ferroelectric memory with password protection
	Field rotation	• Setup can be completed through filed display screen and rotary knob • No special tool is required • Local and remote rotary knobs can be locked • Field rotary knob can select local, remote or halted mode and local electric operation can be realized with the help of field rotary knob under local mode
Conformance with EMC command	EMC command	The actuator conforms to the following requirements: • 2004/08/EMC electromagnetic compatibility • 2006/95/EMC low voltage • The following coordinative criteria • General emission standard for industrial environment EN61000-6-4 • General anti-interference standard for industrial environment • EN61000-6-2 • Rotating electric motor standard EN60034-1 • Protection grade provided by sealing shell (IP code) EN60529

Smart Control

Multi-State Display

- Utilizes a large LCD screen with high contrast and backlight to provide user-friendly information.
- Incorporates three LED indicators in green, yellow, and red, offering distinct visual indicators for valve position and actuator status.
- Allows users to easily ascertain valve position, torque, and actuator status, even in low-light conditions.



Advanced Infrared/Bluetooth Communication

- Enables actuator configuration via the local LCD window.
- Provides a user-friendly menu for real-time analysis of control signals, valve status, operational conditions.

Enhanced Self-Diagnosis

- Offers online diagnosis for 28 types of faults, such as phase loss, power failure, over-torque during valve opening and closing, electric motor overheating, motor overcurrent, and remote signal loss.
- Upon power-up, the actuator performs an automatic self-check of the operating circuit.
- Continuously monitors the circuit in real-time during operation.
- In the event of a fault, the actuator's electric operation is halted, and an alarm is triggered on local display and DCS.

Local control

- Two selectors provide options for Open/Close and Local/Stop/Remote modes.
- In "local" mode, users can control the valve using the Open/Close selector or utilize remote control within a 1-meter range from the actuator display.

Remote Operation

- Control the actuator remotely from the control room using ON/OFF, Analog, or Bus Signals.
- ON-OFF Control: Six Digital Inputs (DIs) enable functions like opening, closing, stopping/holding, emergency shutdown (ESD), opening interlock, and closing interlock. They are opto-electronically isolated for lightning and surge protection, withstanding up to 6KV high voltage.
- Analog Value Control: The built-in analog proportional controller determines the valve position based on analog current, voltage, and potential signals.
- Configurable for Fail Open, Fail Close, or Holding the Last Position.

Emergency Shutdown (ESD)

- ESD can be configured as disabled, with high-level validity, low-level validity, for valve opening, valve closing, motor temperature protection, or auto bypass.
- The ESD signal takes precedence over local or remote-control commands.

Interlock Control

- Two signals can be set up to control one high-safety operation.
- The actuator will only action when both signals are activated. Otherwise, it will hold the last position or stop.
- The interlock function can be configured separately for valve opening and closing.

Hardwired Contacts for Actuator Status

Default includes four passive contacts: S1, S2, S3, and S4. an additional 4 Contacts (S5, S6, S7, and S8) can be provided upon request. Each contact can be configured to indicate:

- Valve position (full open, full close, or any position from 1-99% open)
- Status (opening, closing, in operation, local stop selected, local selected, remote selected, Interlock activated for valve opening or valve closing).
- Alarms (over-torque, manual operation, motor stall, overheat, overload, over-torque, communication failure, power failure, overlimit, sensor failure, ESD, low battery).
- Each contact can be set as “normally open” or “normally closed” with a rated value of 5A, 250VAC/30VDC.

Built-in Relay Contact

An independent relay S0 with passive transferable contact is available for monitoring the actuator’s status. The contact is rated at 5A, 250VAC/30VDC, and can be configured to activate under various conditions, including:

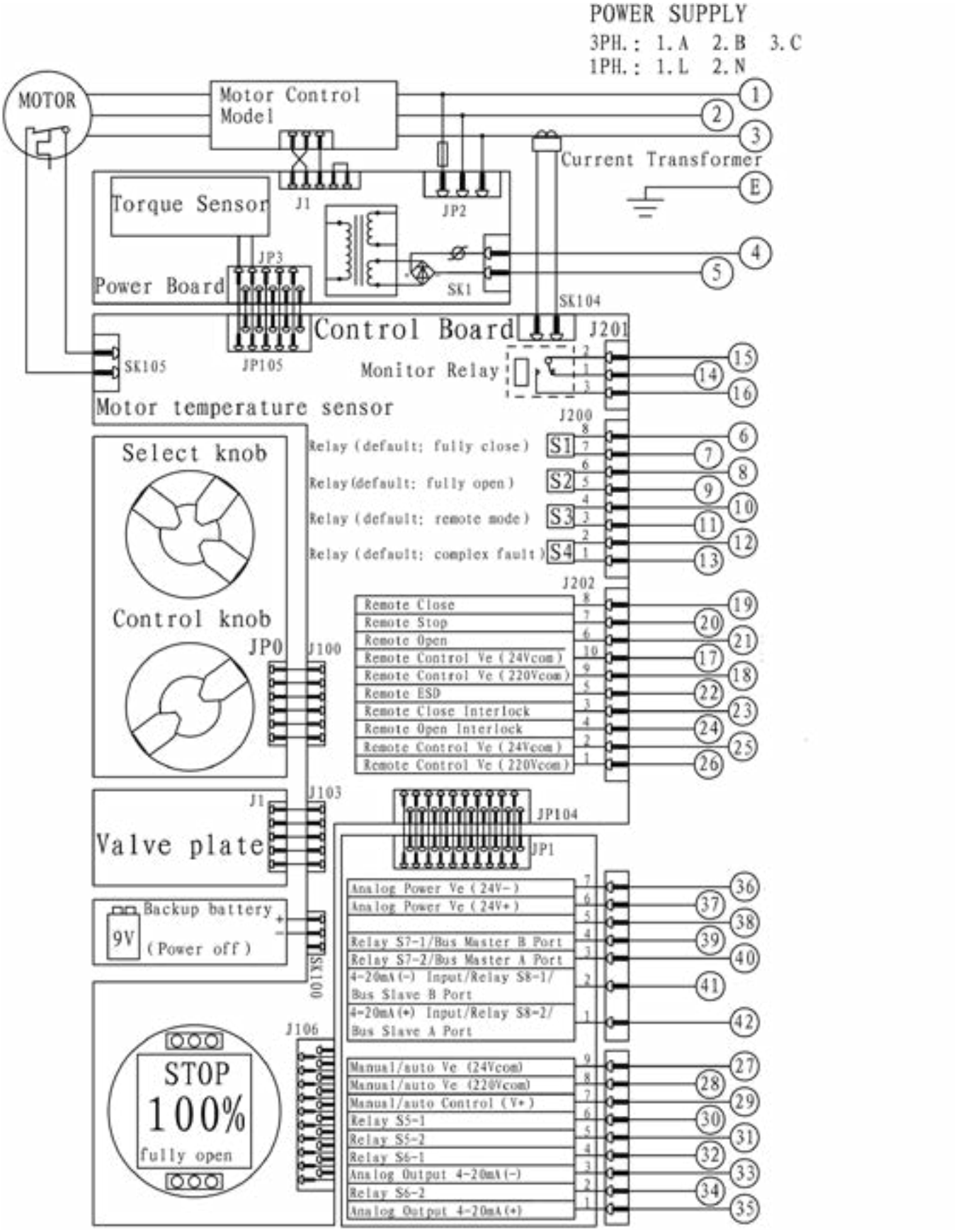
- Power failure [single or multi-phase]
- Control power failure
- Local mode selected
- Local stop selected
- Motor overheating
- Torque sensor failure
- Over-torque during valve opening and closing.

Backup battery

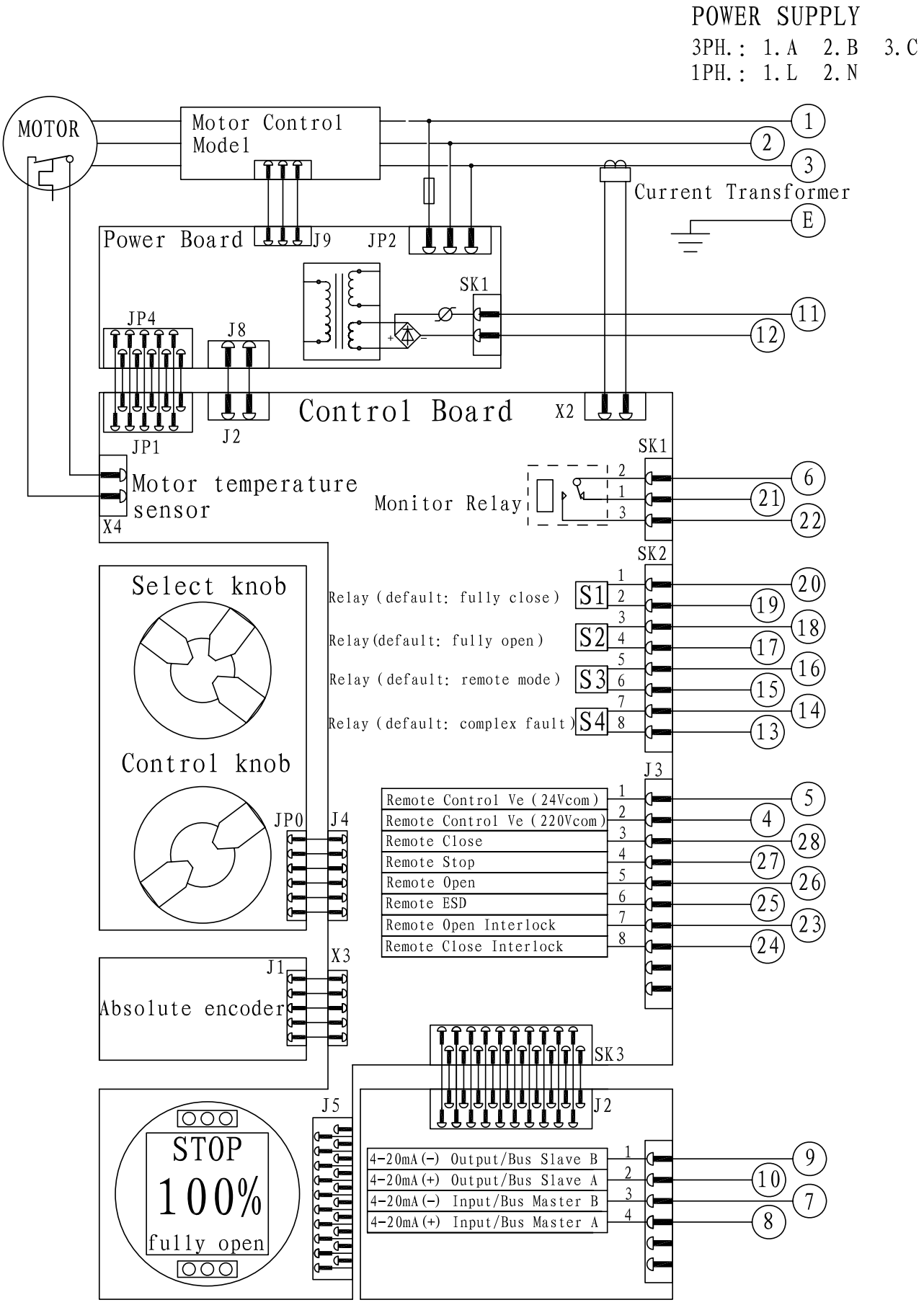
- The backup battery is a 9V lithium battery with a five-year lifespan
- The backup battery keeps essential circuits running during a power failure,
- This enables the actuator to report valve position and record all mechanical operations in the built-in data recorder.
- The display will continue to show the actuator’s status, with the backlight and valve position indicator turned off to conserve power.

Electrical Diagram

HC D Type

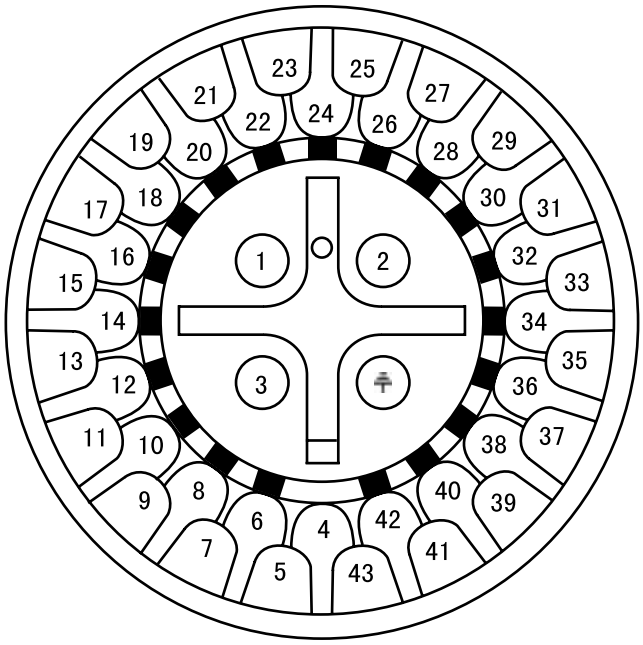


HC DJ Type


POWER SUPPLY
3PH.: 1.A 2.B 3.C
1PH.: 1.L 2.N
MOTOR
Motor Control Model
Current Transformer
Power Board
J9
JP2
SK1
JP4
J8
Control Board
X2
JP1
J2
Motor temperature sensor
X4
Monitor Relay
SK1
SK2
Select knob
Control knob
Relay (default: fully close)
Relay(default: fully open)
Relay (default: remote mode)
Relay (default: complex fault)
S1
S2
S3
S4
JP0
J4
J3
Remote Control Ve (24Vcom)
Remote Control Ve (220Vcom)
Remote Close
Remote Stop
Remote Open
Remote ESD
Remote Open Interlock
Remote Close Interlock
X3
J1
Absolute encoder
SK3
J2
J5
STOP
100%
fully open
4-20mA(-) Output/Bus Slave B
4-20mA(+) Output/Bus Slave A
4-20mA(-) Input/Bus Master B
4-20mA(+) Input/Bus Master A

Terminal Block Wiring

HC D Type

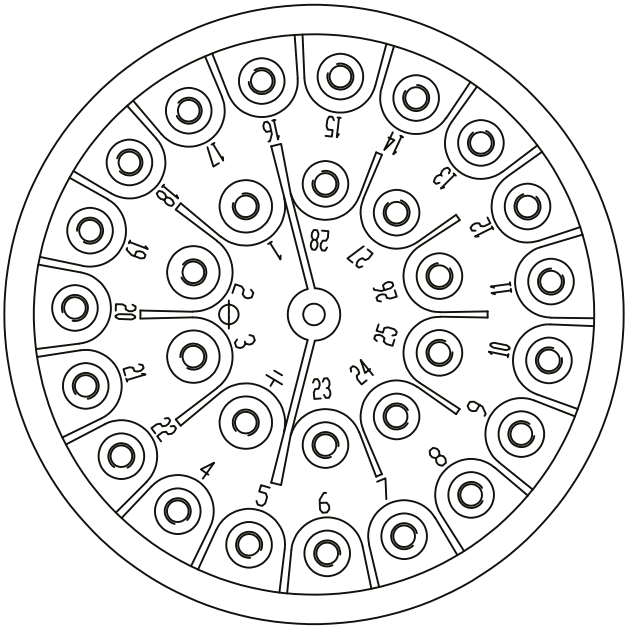


(⏚) Grounding
(1) 3 phase power A/ single phase L1 line (220V)
(2) 3 phase power B/ single phase N line (220V)
(3) 3 phase power C
(4) Internal power source, 24V DC (+)
(5) Internal power source, 24V DC (-)
(6) Limit Switch S1-1
(7) Limit Switch S1-2

(8) Limit Switch S2-1
(9) Limit Switch S2-2
(10) Limit Switch S3-1
(11) Limit Switch S3-2
(12) Limit Switch S4-1
(13) Limit Switch S4-2
(14) Remote monitoring Switch S0-1 (N.C.)
(15) Remote monitoring Switch S0-2 (common)
(16) Remote monitoring Switch S0-3
(17) Remote Control/Input (common) -ve
20-60V AC/DC
(18) Remote Control/Input (common) -ve
60-220V AC/DC
(19) Remote Control for Valve Close
(20) Remote Control for Stop/Stay
(21) Remote Control for Valve Open
(22) Remote Control/Input for ESD
(23) Remote Control/Input of CL Interlock
(24) Remote Control/Input of OP Interlock
(25) Remote Control/Input (common) -ve
20-60V AC/DC
(26) Remote Control/common of Input -ve
60-220 AC/DC
(27) Mal/Auto Input -ve 60-220V AC
(28) Mal/Auto Input -ve 20-60V AC/DC
(29) Mal/Auto Input Control (+)
(30) Valve Torque Switch CTT (-)

(31) Valve Torque Transmitter CTT Voltage (+)
(32) Valve Torque Transmitter CTT Current (+)
(33) Valve Position Transmitter CPT (-)
(34) Valve Position Transmitter CPT Voltage (+)
(35) Valve Position Transmitter CPT Current (+)
(36) 24VDC Input (-)
(37) 24VDC Input (+)
(38) Analogue Signal (0~10V, 0~5V)input (-)
(39) Analogue Signal (0~10V)input (+)
Profibus Control Main Interface B
Indicator Point S7-1
(40) Analogue Signal (0~5V)input (+)
Profibus Control Main Interface A
Indicator Point S7-2
(41) Analogue Signal (0~20mA, 4~20mA)input (-)
Profibus Control Slave Interface B
Indicator Point S8-1
(42) Analogue Signal (0~20mA, 4~20mA)input (+)
Profibus Control Slave Interface A
Indicator Point S8-2
(43) Cable Shield

HC DJ Type

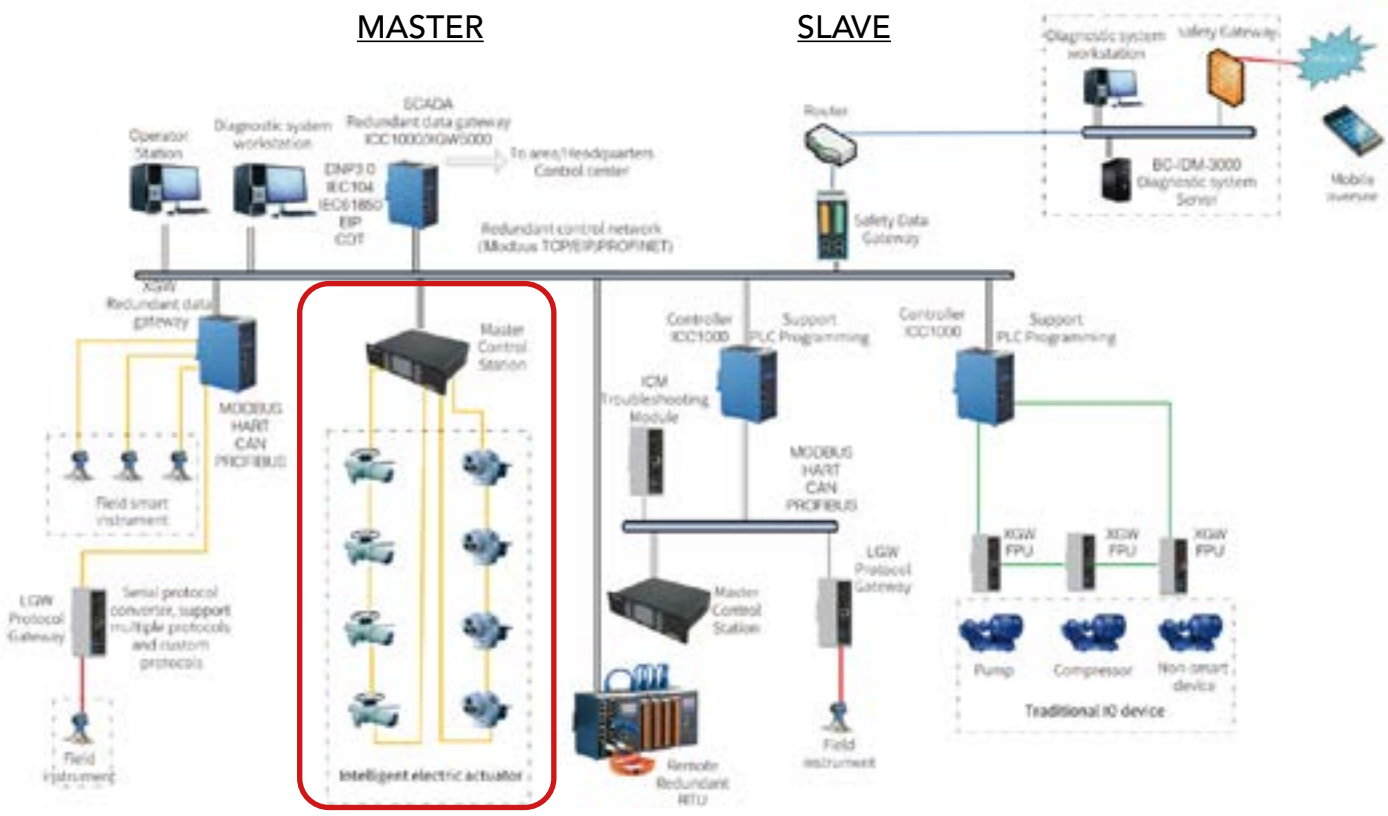


(1) 3 Phase Power Supply A (380V)
Single Phase Firing Line (220V)
(2) 3 Phase Power Supply B (380V)
Single Phase Null Line (220V)
(3) Three Phase Power Supply C (380V)
(⏚) Ground Connection
(4) Remote Control Input of Common-ve (60-220V AC/DC)
(5) Remote Control Input of Common-ve (20-60V AC/DC)
(6) Remote MOnitor Contact Point S0 (common)
(7) Analogue Signal (0~20mA, 4~20mA) (-) Profibus Control Main Interface B
(8) Analogue Signal (0~20mA, 4!20mA) (+) Profibus Control Main Interface A
(9) Valve Position Transmission CPT of Current System (-)
(10) Valve Position Transmission CPT of Current System (+)
(11) Actuator Internal Power Supply Output, Rated 24VDC (+)
(12) Actuator Internal Power Supply Output, Rated 24VDC (+)
(13) Indicator Point S4-2
(14) Indicator Point S4-1
(15) Indicator Point S3-2
(16) Indicator Point S3-1
(17) Indicator Point S2-2
(18) Indicator Point S2-1
(19) Indicator Point S1-2
(20) Indicator Point S1-1
(21) Remote Monitor Contact Point S0(NC)
(22) Remote Monitor Contact Point S0(NO)
(23) Remote Control Input of Opening Valve Chain
(24) Remote Control Input of Closing Valve Chain
(25) Remote Control Input of Emergency Protection
(26) Remote Control Input of Opening Valve
(27) Remote Control Input of Stopping and Maintaining
(28) Remote Control Input of Closing Valve

Wonder HC Master Station® - Revolutionizing MOV Actuator Control

Wonder HC Master Station® plays a pivotal role in creating field ring loops with redundancy capabilities and seamless DCS integration for MOV Actuators field control. Developed based on the Modbus communication protocol RS485, it ensures universal compatibility with MOV actuators from different manufacturers.

Seamless Communication with the DCS via TCP/IP or RS 485. The DCS extracts real-time MOV data, with the DCS acting as the Master and the master station as the Slave.



Key Advantages:

1. **Versatile Connectivity:**
   A single Wonder HC Master Station® connects to up to four ring-loops or two redundant ring-loops, accommodating up to 120 units per ring-loop, expandable to 250 units per ring through software expansion.

2. **Redundancy:**
   Redundant master stations offer hot-swappable capabilities, ensuring uninterrupted operation.

3. **Extended Range:**
   Each loop can communicate over a maximum distance of 30 km, with built-in repeaters in the Wonder HC actuator®.

4. **Built-in Repeater Recommendation:**
   For actuators located at distances of 750m, built-in repeaters are functioning.

5. **High Baud Rates:**
   Long-distance communication maintains baud rates of 9600 or 19200, significantly faster than Current Loop communication at 2400 or 1200.

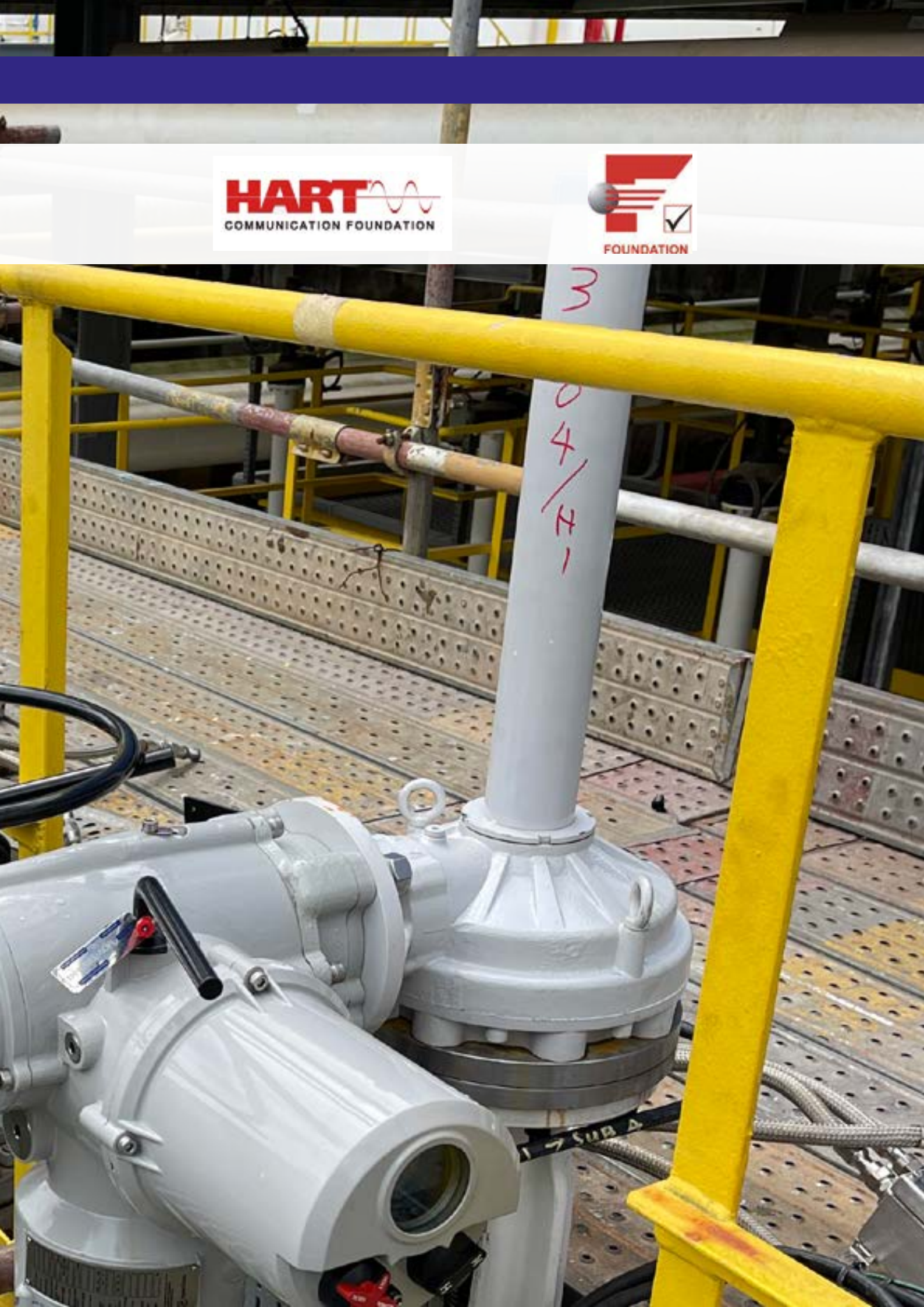
6. **Fast Response Times:**
   MOV scanning and response times range from 50ms to 80ms

7. **Plug-and-Play Repeater Modules:**
   Signal repeater modules are plug-and-play units, slave addresses are stored on the main board behind the LCD screen, unaffected by signal repeater swaps.

Actuator Communication Compatibility

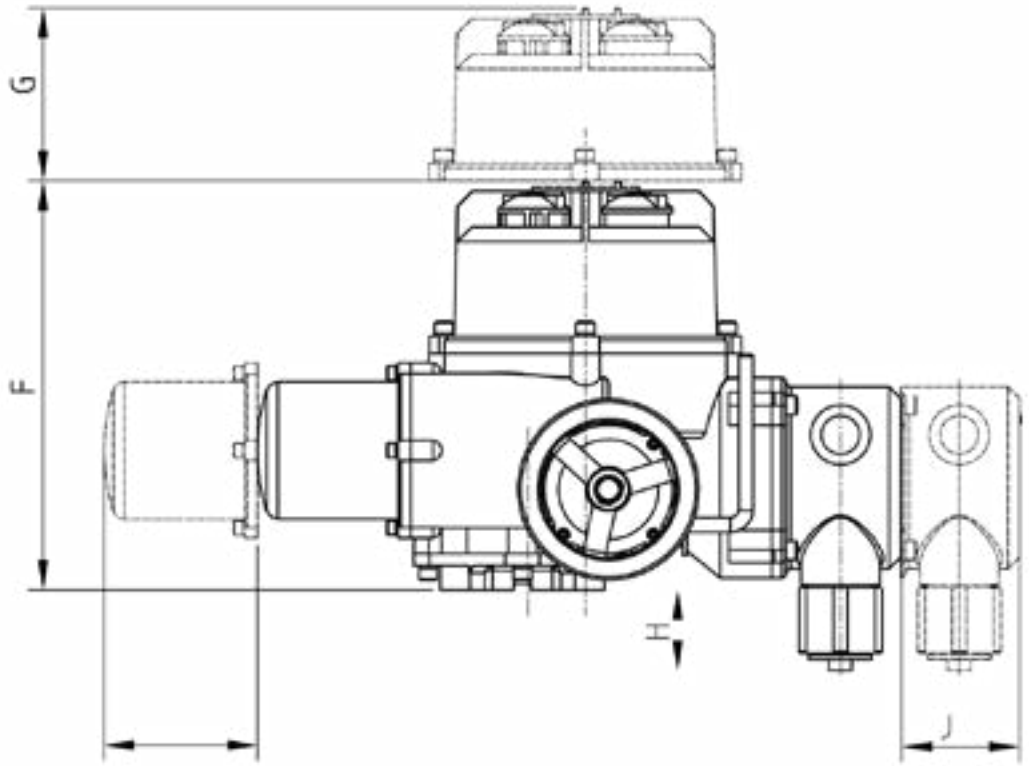
PROFIBUS

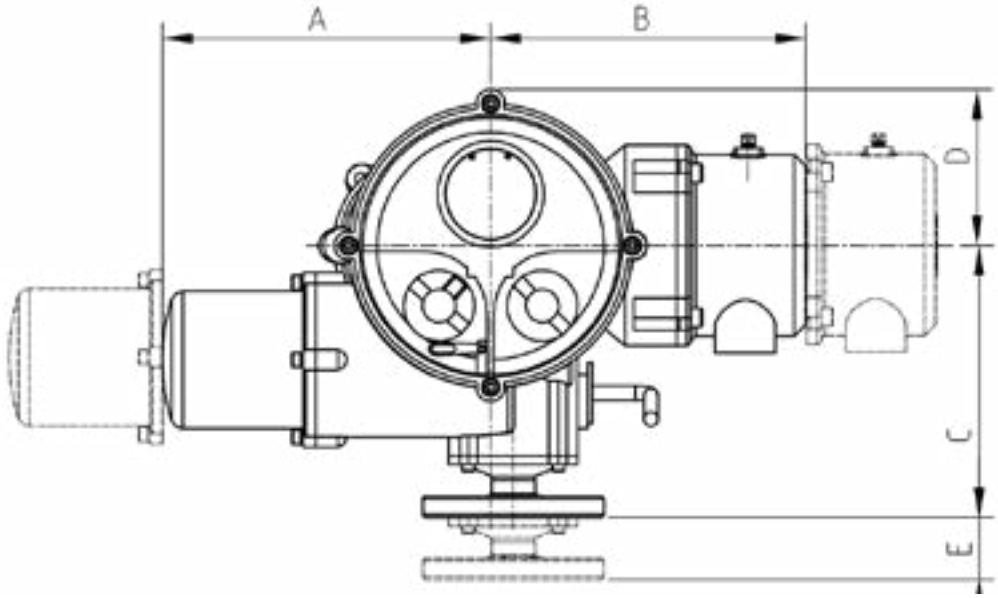
Modbus


HART
COMMUNICATION FOUNDATION
FOUNDATION

Actuator Dimensions

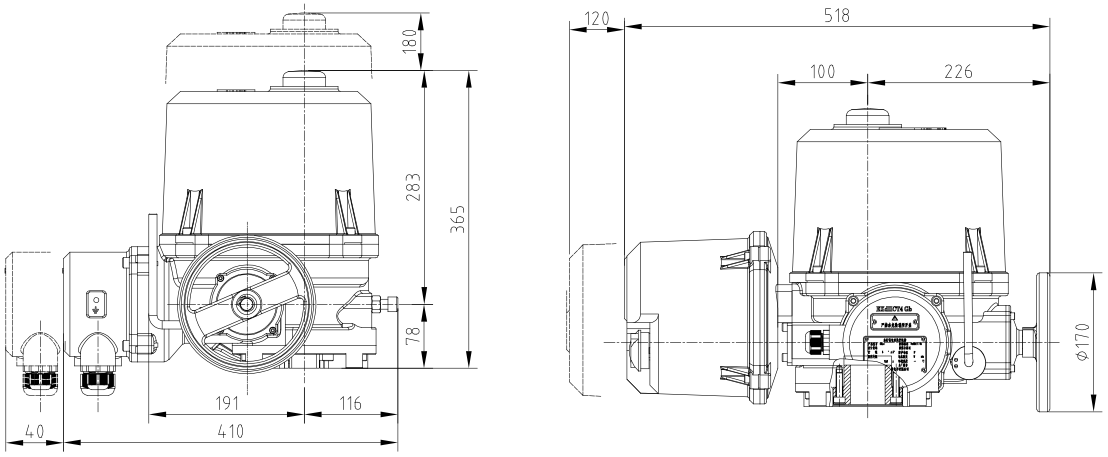
HC DJ Type Integrated Quarter-turn Electric Actuator (HC DJ5 - HC DJ60)



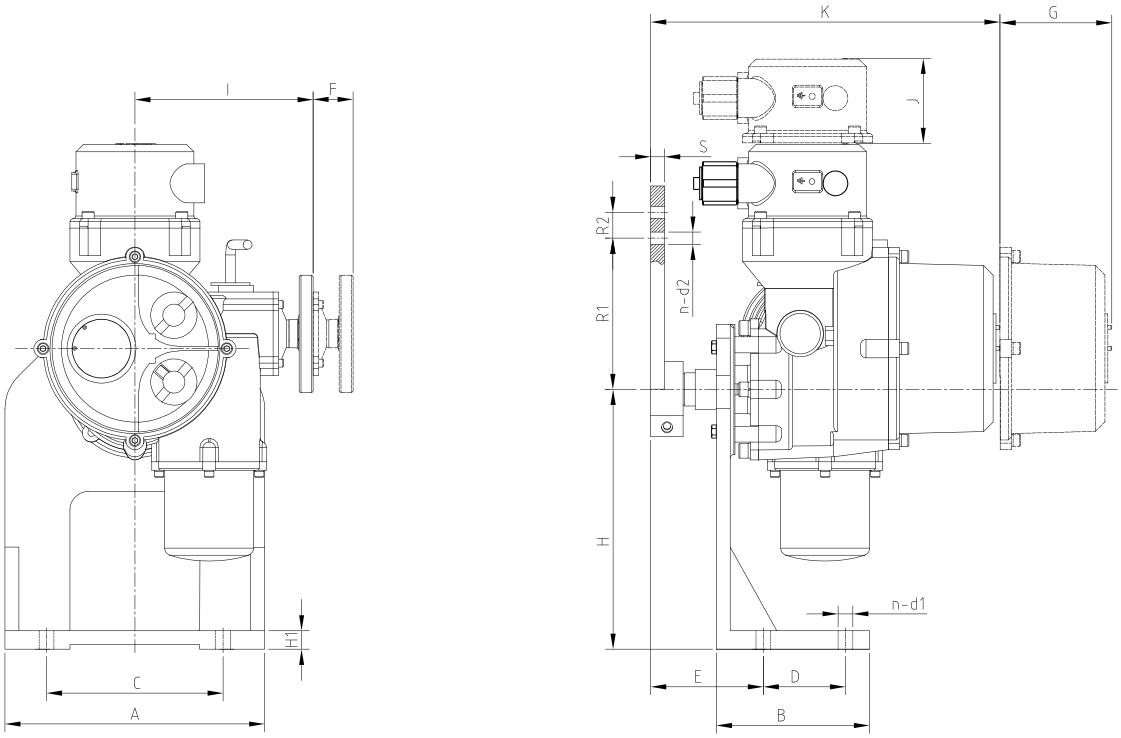


Actuator Model	A	B	C	D	E	F	G	H	I	J
HC DJ5 - HC DJ16	130	270	220	91	40	286	120	30	75	40
HC DJ25 - HC DJ40	230	240	211	110	60	300	125	70	130	40
HC DJ60	187	320	283	137	100	328	130	120	115	40

HC DJ Type Integrated Quarter-turn Electric Actuator (HC DJ80 - HC DJ100)



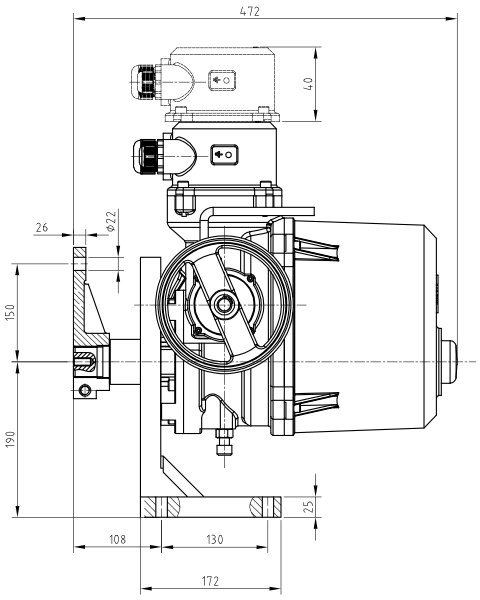
HC-DJ Type Integrated Angle Seat Connecting Arm Dimension Figure (HC DJ10 - HC DJ60)

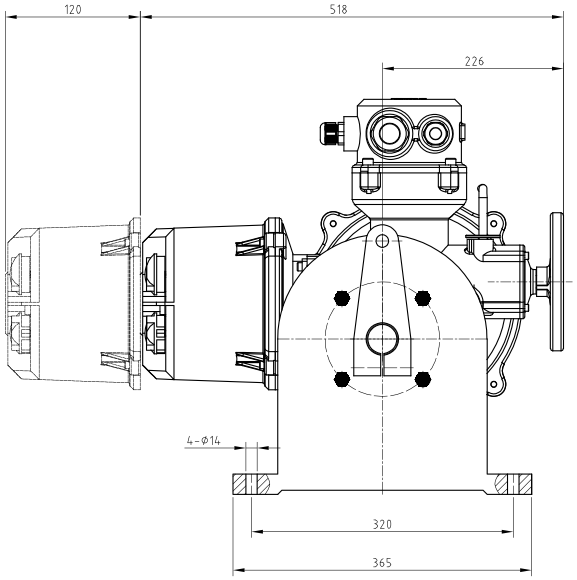


Actuator Model	A	B	C	D	E	F	G	H	H1	I	J	K	S	n-d1	n-d2	R1	R2
HC DJ5 - HC DJ16	230	150	160	80	98	40	120	230	15	220	40	359	15	4-Φ15	2-Φ20	150	50
HC DJ25 - HC DJ40	280	165	200	80	100	60	120	280	20	211	40	400	15	4-Φ15	2-Φ20	150	50
HC DJ60	280	165	200	80	117	100	130	280	20	283	40	410	15	4-Φ15	2-Φ20	150	50

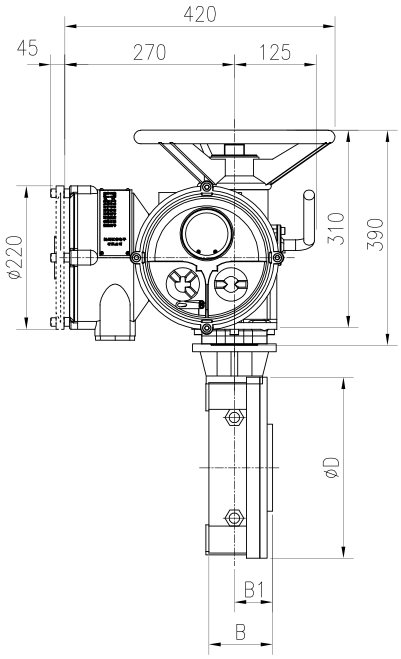
Actuator Dimensions

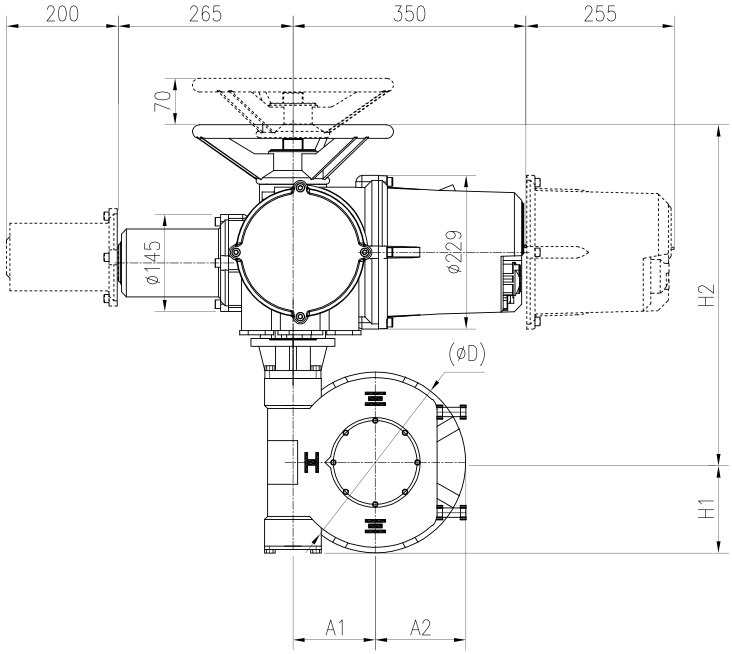
HC DJ Type Integrated Angle Seat Connecting Arm Dimension Figure (HC DJ80 - HC DJ100)





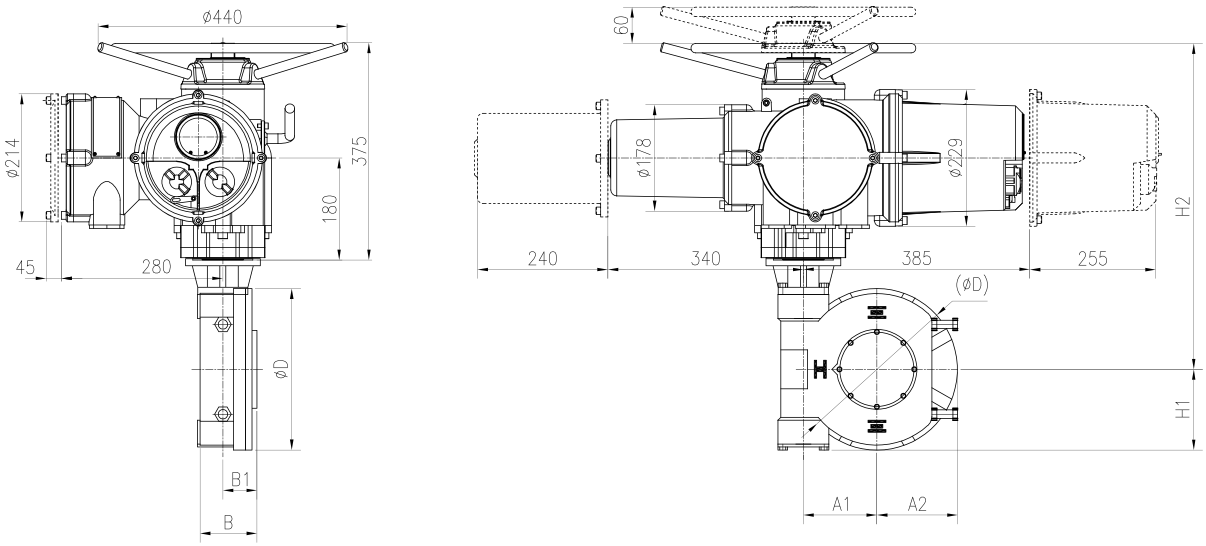
HC DJ Type of Modular Rotary Electric Actuators - Dimensions



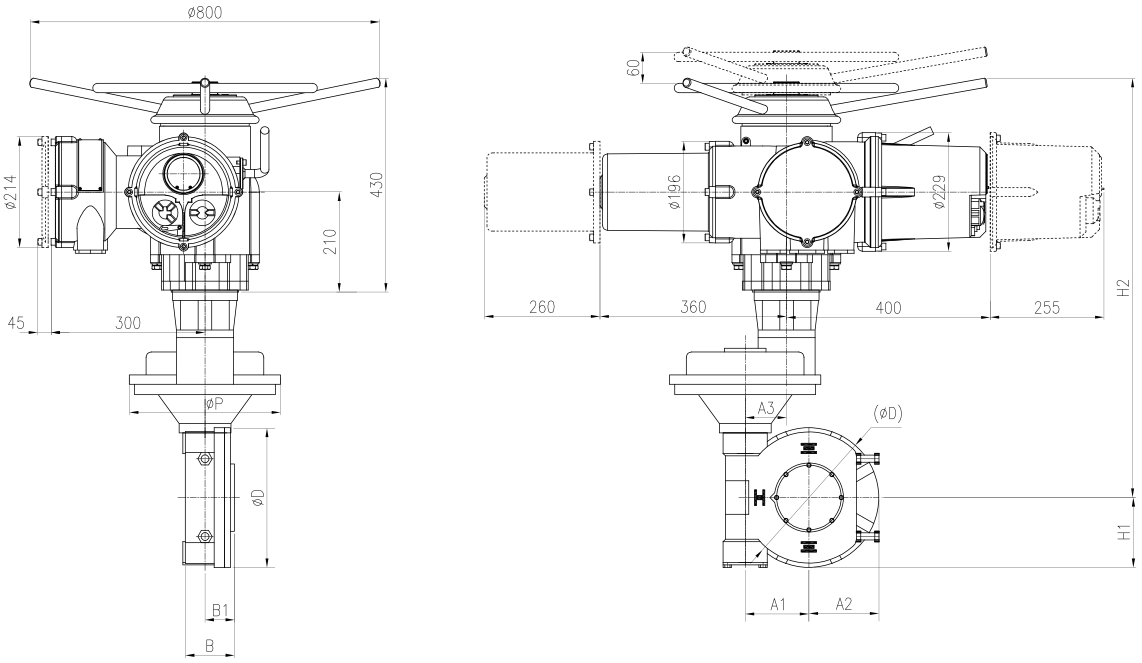


Actuator / Gearbox Type	A1	A2	B	B1	ΦD	H1	H2
HC D4/JW60A	75	85	95	52	170	97	540
HC D10/JW80A	102.5	109	92	54	218	106	550
HC D10/JW100A	135	142.5	125	75	285	135	580

Actuator Dimensions



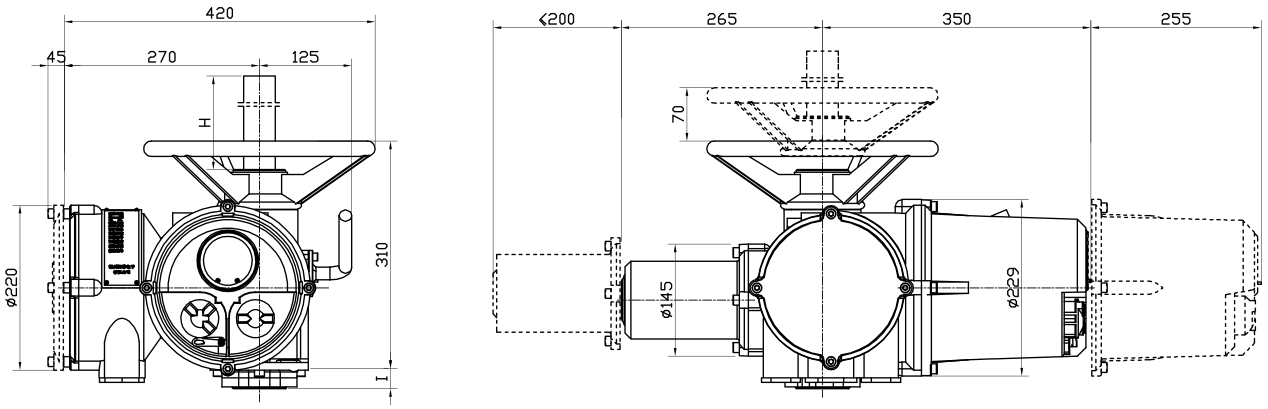
Actuator /Gearbox Type	A1	A2	B	B1	ΦD	H1	H2
HC D25/JW125A	178	187.5	120	70	375	145	572
HC D25/JW140A	210	225	145	86	450	195	672



Actuator / Gearbox Type	A1	A2	B	B1	ΦD	H1	H2	A3	ΦP
HC D60/JW200A	246	260	188	113	520	230	875	130	312
HC D60/JW250A	270	295	200	120	590	265	935	130	312

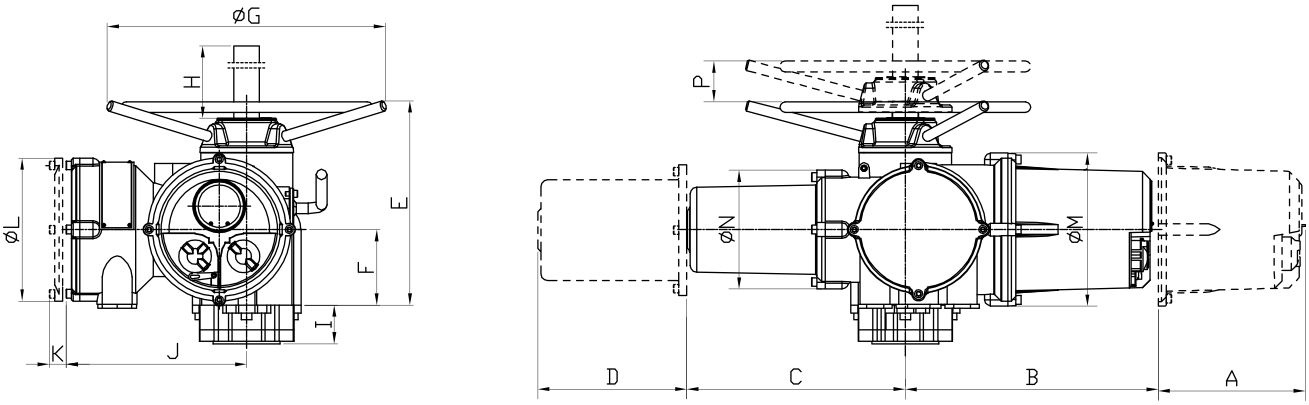
Actuator Dimensions

HC D Multi-turn Electric Actuator (HC D4 - HC D16)



Actuator Model	Standard	Flange	I	H (Customized According to Steam
HC D4/ HC D16	ISO 5210	F10	Torque Mode 40	120.250. 500
			Thrust Mode 55	
	JB2920	2	70	

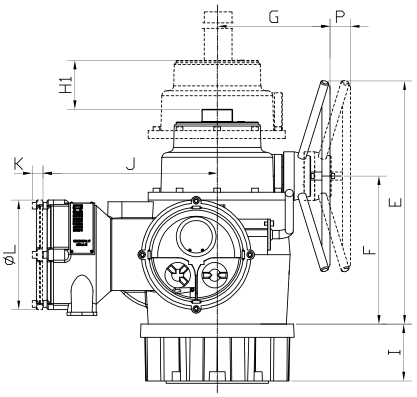
HC D Multi-turn Electric Actuator (HC D4 - HC D16)

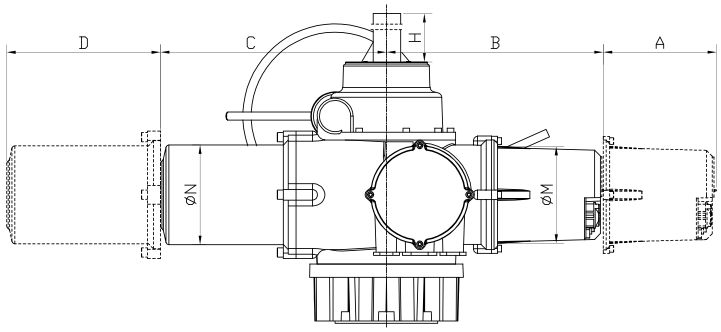


Actuator Model	A	B	C	D	E	F	P	J	K	ΦL	ΦM	ΦN	ΦG
HC D25	255	385	340	240	315	120	60	280	45	214	229	178	440
HC D40 - HC D60	255	400	360	260	365	125	60	300	45	214	229	196	800
HC D90	255	430	445	300	450	150	85	350	45	214	229	196	730

Actuator Model	Standard	Flange	I	H (Customized According to Steam
HC D25	ISO 5210	F14	Torque Mode 60	120.250. 500
			Torque Mode 80	
	JB2920	2	75	
		3	95	
HC D40 - HC D60	ISO 5210	F16	Torque Mode 60	
			Torque Mode 80	
	JB2920	3	70	
		4	110	
HC D90 - HC D120	ISO 5210	F25	Torque Mode 60	
			Torque Mode 80	
	JB2920	ZK-4-100	130	
		ZK-5-100	130	

HC D Multi-turn Electric Actuator (HC D100 - HC D300)

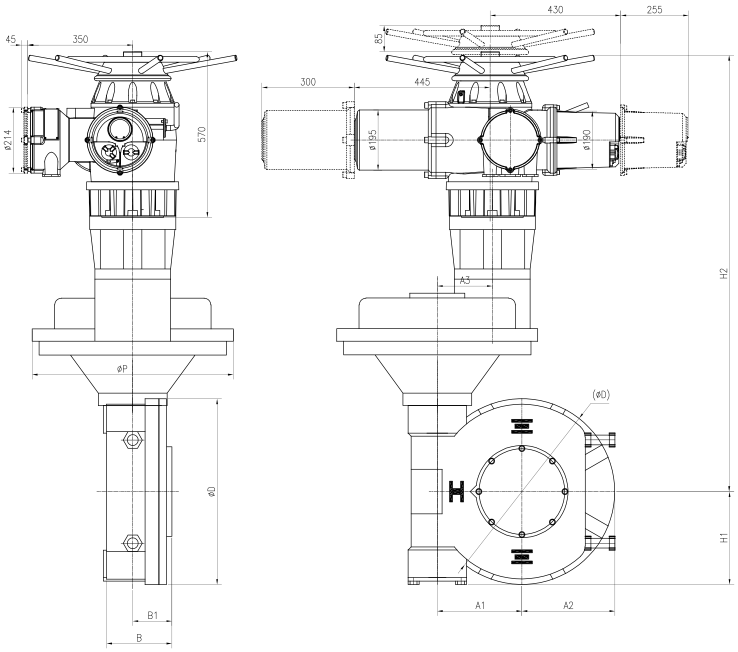




Actuator Model	A	B	C	D	E	F	P	J	K	G	H1	ΦL	ΦM	ΦN
HC D100 - HC D120	255	430	445	300	500	300	40	350	45	230	120	214	190	195
HC D150 - HC D300	255	520	550	320	600	380	60	350	45	435	100	214	190	220

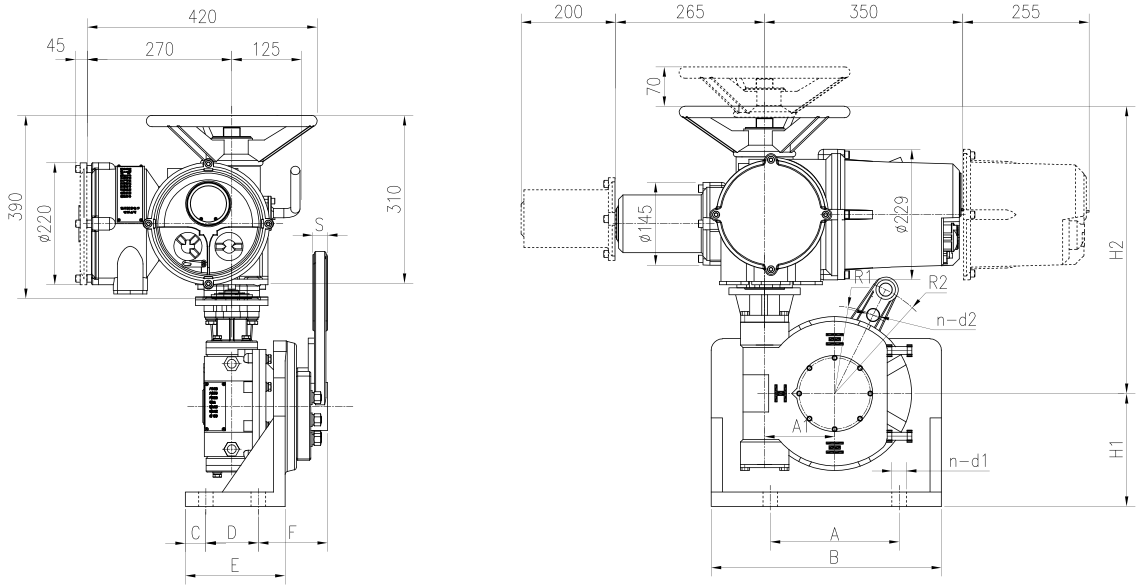
Actuator Model	Standard	Flange	I	H (Customized According to Steam
HC D150 HC D180 HC D250 HC D300	ISO 5210	F25	Torque Mode 0 Thrust Mode 105	120. 250. 500. 1000
		F30		
	JB2920	7		

Actuator Dimensions



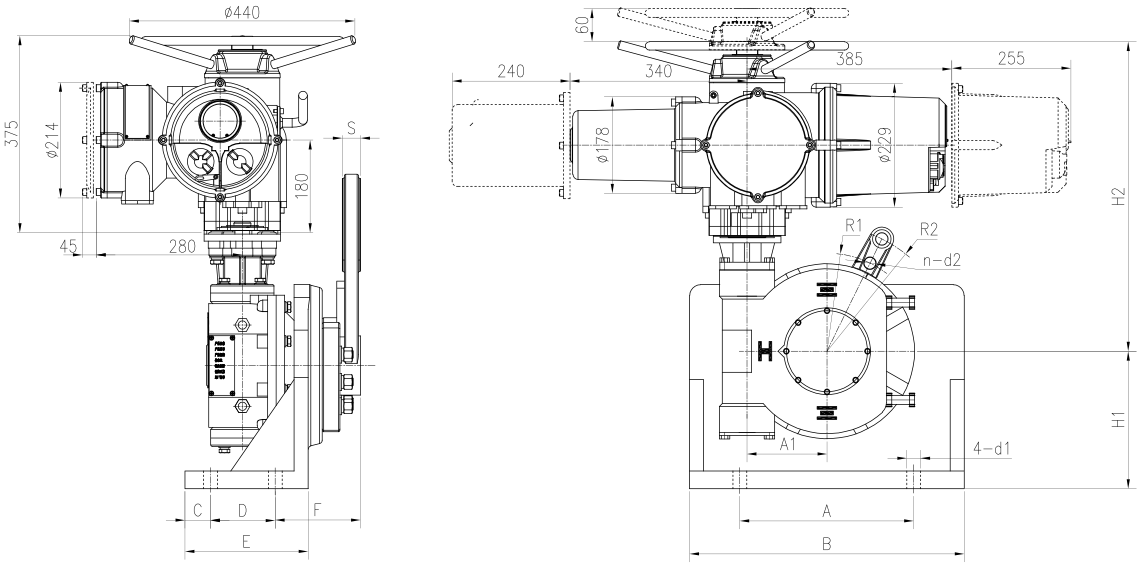
Actuator / Gearbox Model	A1	A2	B	B1	ΦD	H1	H2	A3	ΦP
HC D100/JW280A	342	367.5	264	154	735	305	1108	220	463
HC D100/JW315A	436.5	460	269	156	920	369	1211	220	463

HC DJ Type Combination Quarter-turn Electric Actuator Angle Seat Oscillating Arm Appearance and Dimensions

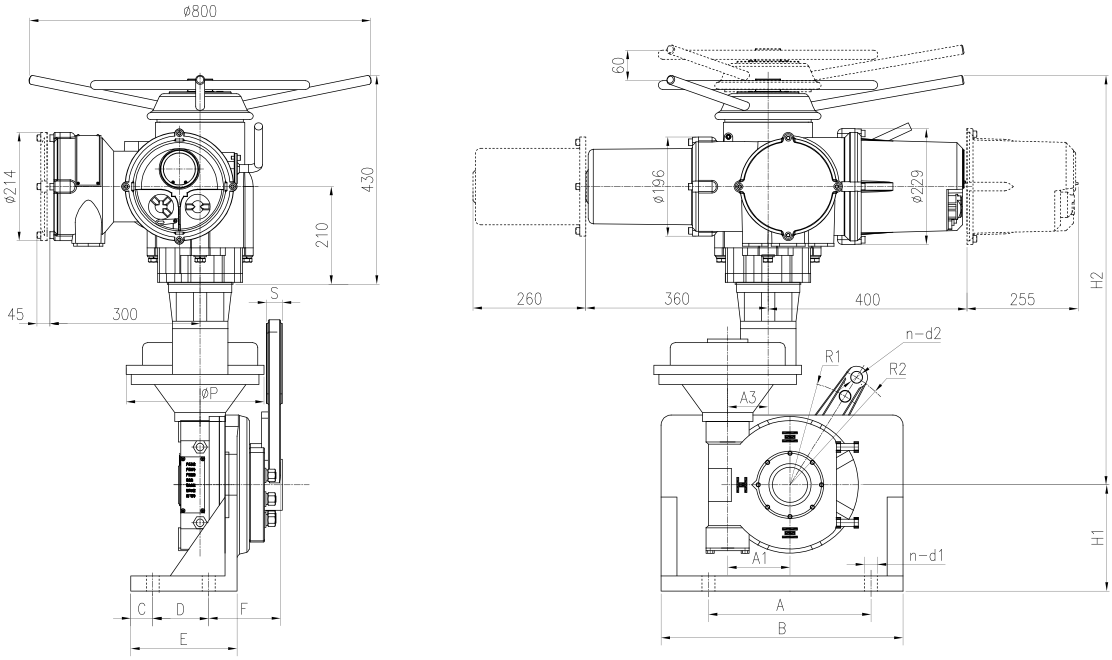


Model	A	B	C	D	E	F	H1	R1	R2	S	4-d1	4-d2	H2	A1
JW60Z	220	310	10	130	180	105	128	120	200	15	4-Φ12	2-Φ20	540	75
KW80Z	320	380	15	130	185	116	190	150	250	26	4-Φ14	2-Φ22	550	102.5
JW100Z	390	450	15	180	240	130	215	170	250	26	4-Φ14	2-Φ22	580	135

Actuator Dimensions



Model	A	B	C	D	E	F	H1	R1	R2	S	4-d1	4-d2	H2	A1
JW125Z	430	520	20	200	270	147	280	170	200	30	4-Φ14	2-Φ26	572	178
KW140Z	510	600	25	270	350	155	330	200	250	30	4-Φ22	2-Φ26	672	210



Model	A	B	C	D	E	F	H1	R1	R2	S	4-d1	n-d2	H2	A1	A3	ΦP
JW160Z	600	700	25	270	350	155	340	250	300	30	4-Φ22	2-Φ26	875	130	130	312

Multi-turn Type

Multi-turn output straight gear reducer

Main features:

- Fully enclosed transmission unit
- Built-in grease for extended service life and reliable sealing
- Broad gear ratio supporting various input ratios for versatile applications
- Easily dismountable drive sleeve for simple processing
- Improved transmission efficiency with the input shaft mounted on ball bearings
- IP68 protection rating
- Operating temperature range from -40°C to +120°C

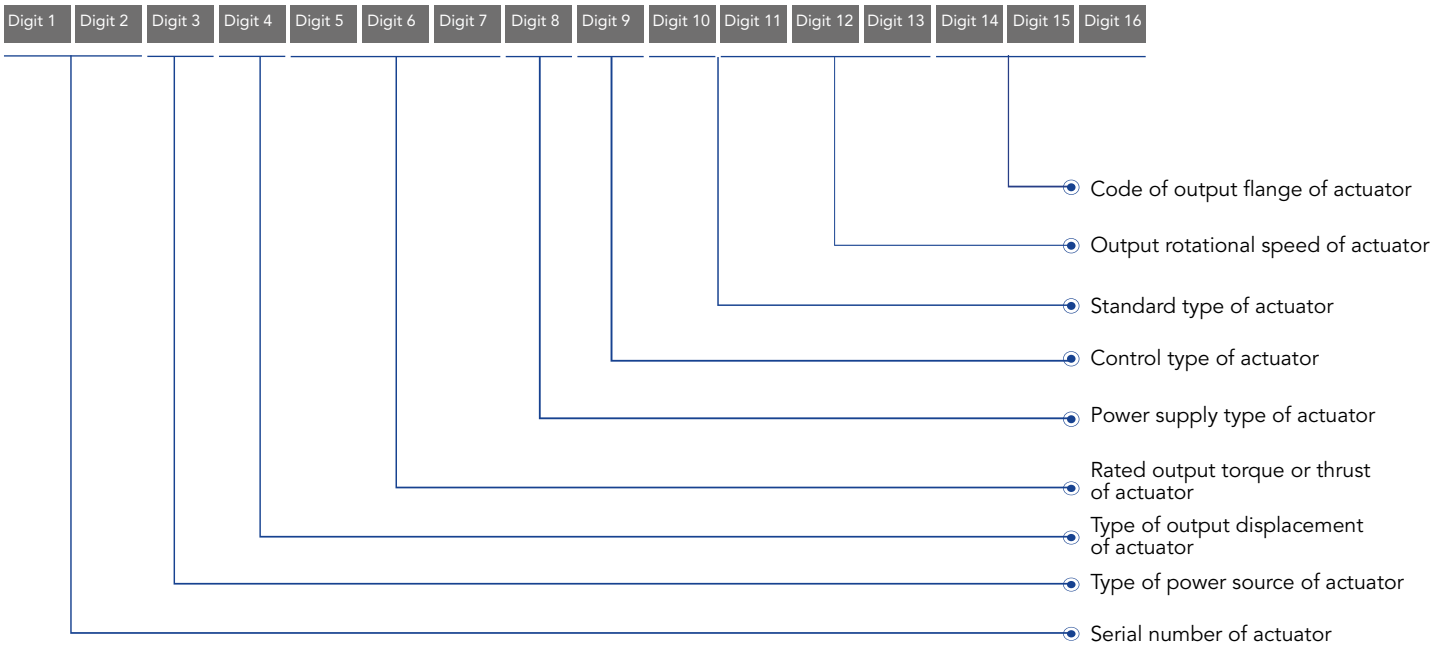
Part-turn Type

Worm gear reducer can provide quarter-turn with lower rotational speed and larger torque, and the torque output can reach 500,000 Nm

Main features:

- Fully sealed transmission unit
- Built-in grease enhances service life and ensures sealing
- Broad gear ratio supports a wide range of input ratios for various applications
- Self-locking capability of the worm support in terms of angle and direction
- Easily dismountable drive sleeve for streamlined connection processing, compatible with a mechanical limit of 0-90°
- IP68 protection rating
- Operating temperature range from -40°C to +120°C

The model of Wonder HC actuator is a 16-bits word string composed of numbers and letters without any space.



1.	Digit 1,2	Serial number of actuator includes capital letter HC
2.	Digit 3	Type of power source of actuator includes D-electric; and Q-pneumatic
3.	Digit 4	Type of output displacement of actuator, non-multi-turn; M-linear travel; J-part-turn
4.	Digit 5,6,7	Rated output torque and trust of actuator, torque: Nm 1/10 indicates no zero filling Thrust: 1/KN indicates (in terms of three-phase supply and 24r/min standard)
5.	Digit 8	Type of power supply of actuator D-single phase I- three phase
6.	Digit 9	Type of control of actuator A-customize B-switch value control, analog value feedback C-switch value control, switch value feedback D-analog value control, analog value feedback M-Modbus protocol F-FOUNDATION Fieldbus P-PROFIBUS H-HART N-PROFINET
7.	Digit 10	Standard type of actuator: non-standard; E-ATEX; B-explosion proof IIB; C-explosion proof IIC; S-frequency; Q-frequency explosion proof
8.	Digit 11, 12, 13	HC D series: output rotational speed of actuator (r/min) -6,12,18,24,36,48,72,96,144,192 HC J series: Code of connecting flange of actuator: F07-F60(ISO5210) or No. 2-7 flange (JB2920)
9.	Digit 14,15,16	HC D series: Digit 14, 15 and 16 constitute the code of connecting flange of actuator, F07-F40(ISO5210) or No.2-7 flange (ISO5210) HC DJ series: A: flange (direct connection); Z: spherical hinge (connecting arm)

Example: For PROFIBUS - if the torque is 600Nm and power supply type is three phase, IIB explosion proof grade and an output rotational speed of 24rpm, then the intelligent multi-turn actuator with connecting flange F16 can be denotedas HC D60IPB24F16.

Example: For regulating type - if the thrust is 25kN and power supply type is three-phase with Modbus interface, IIC explosion proof grade and an output rotational speed of 24rpm, then the intelligent linear actuator with connecting flange F14 can be denoted as HC-DM25IMC24F14.

Example: For on/off type - if the output torque is 100Nm and the power supply type is three-phase supply with analog feedback, IIB explosion proof grade, the directly connected intelligent quarter-turn actuator can be denoted as HC DJ10IBBF07A.

WONDER®

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