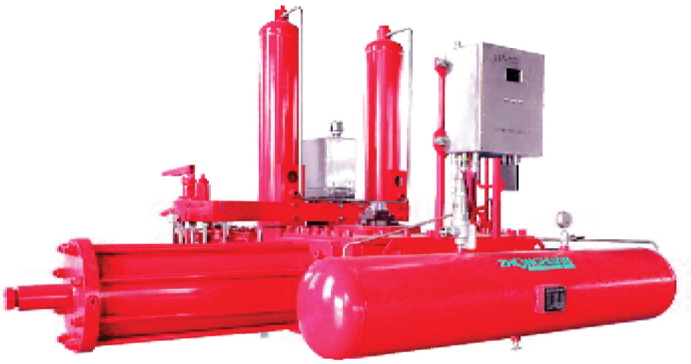
GAS OVER OIL ACTUATOR

DAEJU CONTROL CO., LTD

Daeju Control Co., Ltd.

“Passion and devotion of DJC engineer has been source of innovation.
Commitment to the project was always been second. First should be and must be affection to the client.
Project work needs long time relationship and commitment with strict schedule work with perfection on the system.
That’s why DJC like the word , specialist.“

Application of Gas Over Oil Actuators



Application of Gas Over Oil Actuators

- Applicable to severe services for angular-stroke fully-open and fully-close valves such as ball valve, butterfly valve and plug valve etc.
- Applicable to severe services for linear-stroke fully-open and fully-close valves such as gate valve and stem-lifting ball valve etc.

Gas over oil actuators take pipeline natural gas or nitrogen as power, and hydraulic oil as driving medium to actuate the pipeline valve to open or close. It has basic control functions including: locally pneumatic control, manually hydraulic pump control, line break automatic protection, remote control, ESD control and so on.


factory testing under -40!

Typical Applications of Natural Gas Transmitting:

Emergency Shutdown	Line Break Protection
Station Blowdown	Two-way Remote Control
River Crossings	High-pressure and Low-pressure Shutdown
Station By-pass	Station Entrance and Exit Protection

Compressor Loading/Unloading Protection

Replacement of Pneumatic Actuator of Large Torque

Applicable Temperature Range: General Services: # 20! ~ +85! Cold Services: # 40! ~+85!

Natural Gas Supply Pressure: 0.5MPa~15MPa; If the pressure is out of this range, please consult the factory.

Supply Gas from Nitrogen Bottles: t he zero-leakage pneumatic c ontrol module enables Dae ju co. gas over oil actuators to be used on high-sulfur natural gas pipelines and oil transmission pipelines, with nitrogen bottles as the power supply. The nitrogen bottles just need to be replaced for 1 to 2 times every year to guarantee the actuator have sufficient power. It is more convenient and cost-saving for customers.

For pipeline (e.g. city natural gas supply) of lower than 1Mpa, we can provide different solutions to drive the valve with reliable action.

The traditional mechanical control system is bulky in dimension, inconvenient for operation, unrecorded and incapable of analyzing the pressure of the pipeline. The electronic monitoring system LBP-1000 with a micro-processor would be the most appropriate standard configuration.

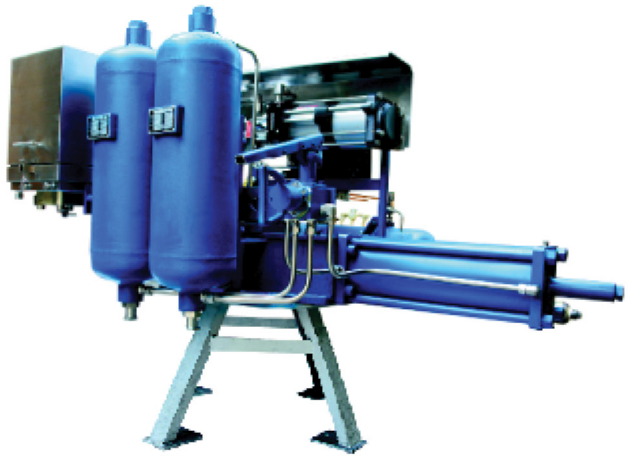
Application of Gas Over Oil Actuators

Controls chematics andt he functions

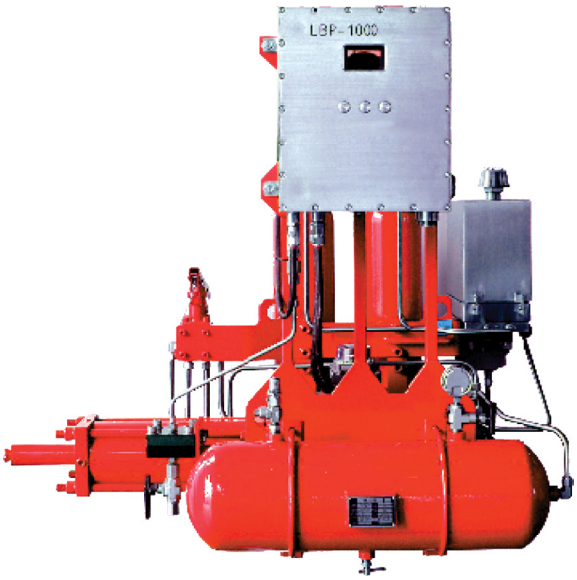
Control Schematic	Functions	Solenoid Valve	Locally Reset	Conditions Required
ZH6616	PSH/PSL/PDRA utoP rotection	Energized	Y	Solar Power Supply
ZH6617	PSH/PSL/PDRA utoP rotection Remote Open/Close Valve	Energized Energized	Y N	24VDC+RTU
ZH6618	PSH/PSL/PDRA utoP rotection ESD	Energized De-energized	Y Y	24VDC
ZH6619	PSH/PSL/PDRA utoP rotection Remote Open/Close Valve ESD	Energized De-energized Energized	Y Y N	24VDC+RTU
ZH6620	Remote Open/Close Valve ESD	Energized De-energized	N Y	24VDC
ZH6621	Remote Open/Close Valve	Energized	N	24VDC
More schematics and functionsa re available, please contactw ithu s.				

Gaso verO il Actuator with Booster

- Solutions to city natural gass upplyp ipelineo fl ow pressure
- Solutions with instrument air
- Substitution of pneumatica ctuatoro r electro-hydraulica ctuator
- Minimum gasp ressure: 0.3MPa



Model Selection & Torque Chart



Model : GDO - 15Y2 - 180 / LBP - 1000

- **LBP - 1000** — Line Break Protector Version
- **180** — Hydraulic Cylinder Diameter
- **15Y2** — 15: Actuator Model; Y: Scotch-yoke mechanism; 2: Double Cylinder
- **GDO** — Gas Over Oil. Gas Over Oil Actuator

Torque Chart

Actuator Model	03	06	09	15	30	60	100	200
Maximum Output Torque (KNm)	4.59	.0	13.5	22.5	45.0	90.0	150	300
Hydraulic Cylinder Specification(mm)	60,	70,	80,	90,	100,	140,	160,	180, 220, 240, 280

Standard Configuration : Gas-oil Tanks, Scotch-yoke mechanism, hydraulic cylinder, hand pump, directional control valve, pneumatic control valve assembly (with stainless steel housing), gas storage tank, shutdown valve, shuttle valve, gas filter, muffler, and LBP-1000 etc

Introduction of Part unit

1. Pressure Vessel

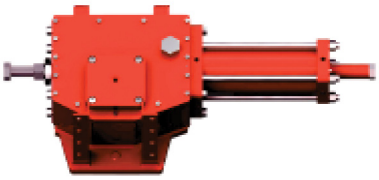
a.D esigning,m anufacturing andi nspectings tandard- GB 150 Steel Pressure Vessel;

b.A mbient temperature: General: −20！ ~+85！ ,
Special: −40！ ~+85！ ;

c.M eetingT SGR004-2009 Fixed Pressure VesselsS afetya nd TechnicalR egulations,P roviding qualityi nspection report and thec orresponding manufacturing files;

d.G oods tructure ands trength, with heat-shrinkt echnology.

2. Scotch-yoke Mechanism



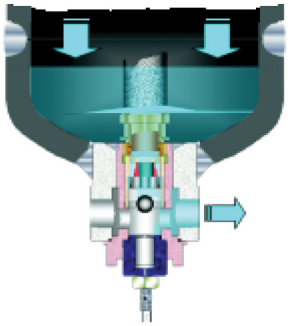
a.L imit screws areu sed for fully-opena nd fully-closeds troke adjusting

b.A water-proofo bservation hole (top)a nd ab reathing hole (bottom) is on the mechanism.

c. Perfect sealingp erformance

d. Output torquei s more fitted with ball valve.

3. Flow Control Valve

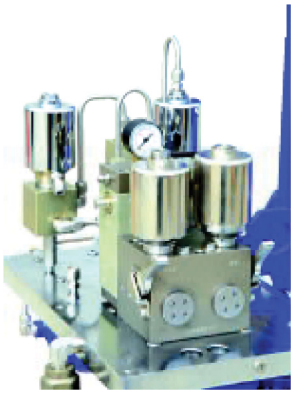


a.H iddens tructure design

b.A djusting the duration of open or closet he valve independently

c.F iltering the hydraulico il.

4. Pneumatic Control Valves Assembly



A.M odular andi ntegratedd esignf or saving space, reducing troublea nd simplifyingo peration

B.P neumatic control valves assembly is made of aluminum alloy with anodizings urface treatment

C.B ubble tight, especiallys uitable forn itrogens ervice

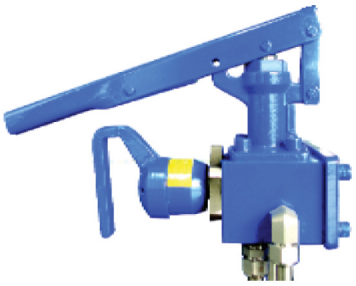
Introduction of Part unit

5. Hydraulic Hand Pump

a.C ompact structure, simple and easy for operation, directionalc ontrol valve fors witchovero fo pening or closing the valve;

b.H andp umph as ac onstanth ydraulic oilo utputb y every swingo fi ts handle;

c.B ig cylindersa re equipped with high flowh andp umps for operation.



6. Torque-limitingD evice

a.F irst and foremost,t he valves hall be actuated reliably, then the torquel imitingd evicei su sed for the protection of valves tema nd actuator from damage, commonly used when the pipeline pressure hasa wide range.

b.W hen thep ressureo f the gas/hydraulict ank exceedst he valuep resetted,t he torque limiting device will blockt he input of gas source and vent the gas in the gas/oilt anka t the same time.T he output torque of the actuator is thusl imited and thes tema nd actuator arep rotected.

7.SurfaceT reatment Technology

a.H arda nodico xidation

Thet hickness of oxide film>=100um;

Strengthenings urface hardness of material;

Good wear resistance anda nticorrosion whichc an obviously Prolongl ife.

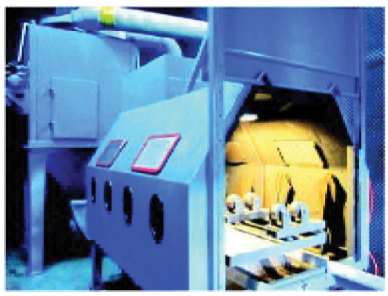
b. Painting

Sandblasting and derusting:T he surface roughness reaches SA 2.5,p artially to SA 3.0;

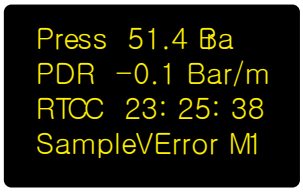
Introducing theA kzoN obel paintingp rocedure;

Thet hickness of epoxyp rimerc oating is 100-160um,a nd the Polyurethane top coatingi s 60-100um;

Effectivelya nticorrosive for long life.



Features



Explosion-proof/Protection level

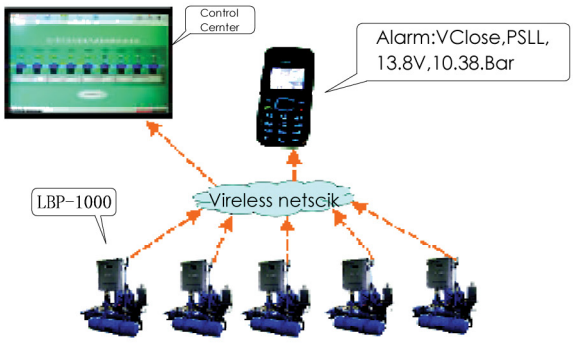
Enclosure explosion-proof level: Exd II BT4/CT4/ATEX
Solenoid valve explosion-proof level: Exd II CT4/ATEX/SIL2
Junction box explosion-proof level: Exd II CT4
Limit switch explosion-proof level: Exd II CT6/ATEX
Pressure transducer explosion-proof level: Exd II CT6/ATEX
Overall protection level: IP65

Line Break Protection Unit

- Monitor real-time pipeline pressure and pressure drop rate
- Automatically judge whether the line is break for emergency shutdown
- Guarantee the safety of the pipeline when running

Distinctive Highlights of LBP-1000

- OLED display screen-All-Weather working , even below -40! ;
- English-Chinese interface-Convenient for your management;
- Low power consumption and more than 30 years' lifetime;
- Explosion-proof design, surge protected design, and loss-prevention of cathodic protecting current design;
- Integrated solar power supply is available;
- USB communication port;
- Least square method - Applied for curve fitting with a control and measurement precision up to 0.5%;
- Extreme values of pipeline PSH, PSL and PDR - Providing basis for settings;
- Recorded pressure variation - Improving accuracy of automatic protection.
- SCADA-GPRS monitoring and control system. (optional)
- GSM short message for alarm. (optional)
- Combustible gas alarm and entrance guard. (optional)



Vireless SCLUTION

RS485 or usb communications Interface

Remote wireless solutions for gas over oil actuator monitoring and control, timely action for emergency situation with low cost.

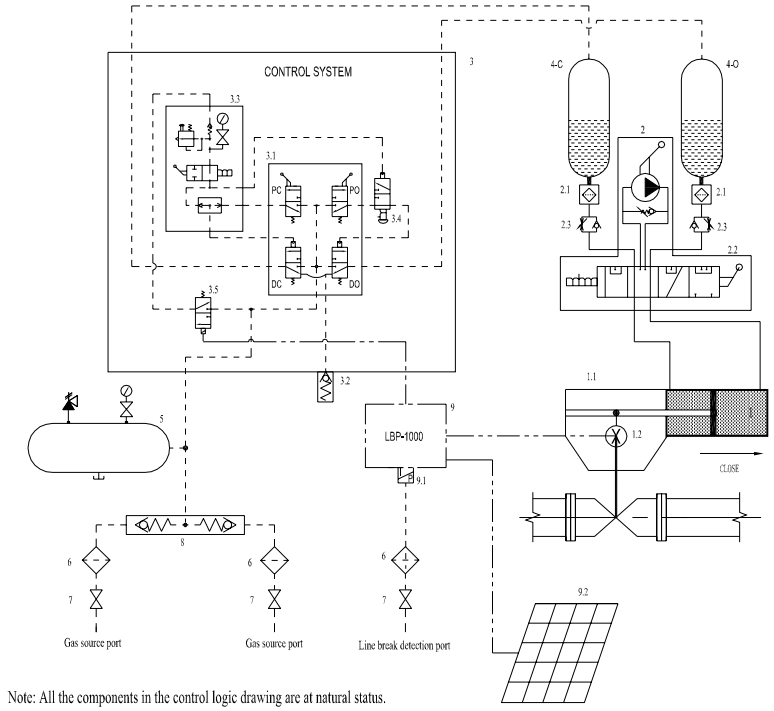
- Monitoring including: pipeline pressure, valve position, alarming, etc.

Convenient operation, reliable hardware , applicable software, precisement measure and control.

Technical Specification

Environmental adaptability	Electronic control unit	-40! ~ +85!
	Mechanism and control system	-40! ~ +85!
Electrical adaptability	External power	+24VDC
	Power	0.42W
	Solar battery	38AH /12VDC
System sealing	Control valves static gas leakage	10Mpa solenoid valve and control valves integrated assembly
	Oil cylinder	no leakage
Electronic control unit characteristics	Display technology	OLED low temperature all-weather display can clearly watch in darkness or strong light
	Working mode of Pressure sensor	Continuous power supply
	Explosive-proof grade of Pressure sensor	Exd IIC T4
	HMI language	Chinese and English
	Explosion-proof of electric enclosure download and	Exd design, communication without opening the enclosure, including USB and RS485.
	Remote communication protocol	Standard MODBUS-RTU
	Cathodic current loss Prevention	Enclosure insulation With the pipeline.
	Surge protection	Surge protections are designed on board, pass EMC grade B test.
	Electronic control unit power supply	38 AH battery+25 W solar panel, low power consumption, all placed inside the enclosure.
Damageable parts	Damageable when transporting or hoisting	Haven't found the components easily damaged
Applicability of the software	Valve position indication and pressure record	Valve position display and abnormal alarm; 256 pressure varying record.
	Extreme value record	PSH, PSL and PDR extreme value recorded
	Control precision	LBP-1000 >0.5%

Technical Specification



Note: All the components in the control logic drawing are at natural status.
The solenoid valve is not energized.

Pneumatic connection
Hydraulic connection
Electric connection

PARTS DESCRIPTION

1 HYDRAULIC ACTUATING MECHANISM
.1 SCOTCH-YOKE BOX 1.2 LIMIT SWITCH
HYDRAULIC HAND PUMP
.1 HYDRAULIC FILTER 2.2 DIRECTIONAL CONTROL VALVE 2.3 FLOW RATE ADJUSTING VALVE
PNEUMATIC CONTROL VALVES ASSEMBLY
.1 3/2 CONTROL VALVE 3.2 VENTING PORT 3.3 3/2 CONTROL GAS VENTING VALVE 3.4 MANUAL RESET PILOT VALVE 3.5 3/2 NC SOLENOID VALVE
GAS/OIL TANK
GAS STORAGE TANK
GAS FILTER
CUT OFF VALVE
HIGH-PRESSURE SHUTTLE VALVE
LBP-1000 ELECTRONIC CONTROL UNIT
.1 PRESSURE TRANSDUCER 9.2 SOLAR POWER SUPPLY SYSTEM

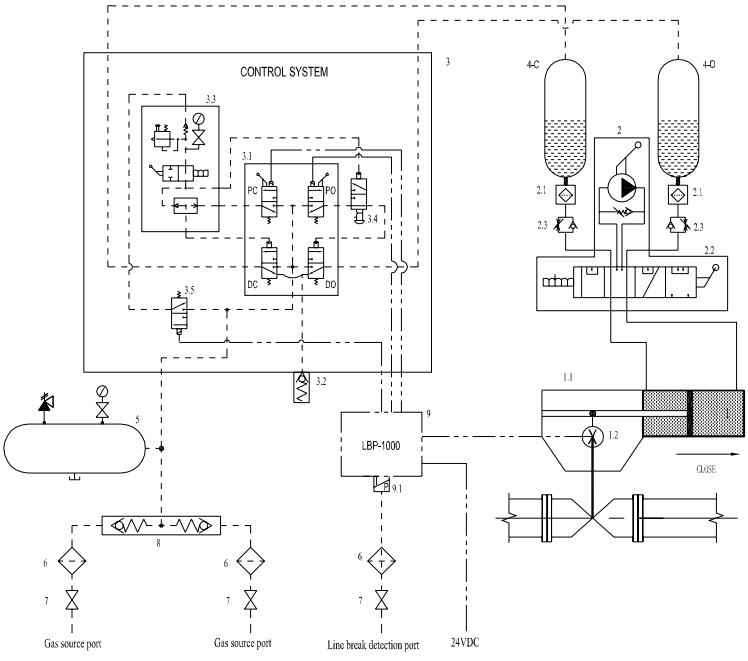
OPERATING INSTRUCTION

LOCAL CONTROL
PRESS LEVER ON VALVE 3.1 PO TO OPEN OR 3.1 PC TO CLOSE.

LINE BREAK OPERATION
A RATE OF PRESSURE DROP IN THE PIPELINE,OR THE DIFFERENTIAL PRESSURE IS HIGHER OR LOWER THAN THE PRESET VALUE, THE LBP TRIPS THE VALVE 3.5 TO INHIBIT OPEN OPERATION AND THE POWER VALVE 3.1C CAUSES THE ACTUATOR TO CLOSE. AFTER THE LINE BREAK INTERVENTION. THE INHIBITION VALVE 3.5 MUST BE MANUALLY RESET BEFORE THE ACTUATOR CAN BE REOPENED

MANUAL OPERATION
SELECTED BY THE VALVE 2.2 THE OPENING OR CLOSING OPERATION AND ACTUATE THE HAND PUMP 2 THE DIRECTIONAL CONTROL VALVE 2.2 MUST BE IN "AUTOMATIC" POSITION TO ALLOW THE OPERATION WITH GAS SUPPLY.

Draw No.	ZH6616S	LOCAL CONTROL/MANUAL OPERATION LINE BREAK PROTECTION SOLAR POWER SUPPLY SYSTEM
Drawn by	-	Gas Over Oil Actuator Control Schematic
Approved	-	
Date	2012.05	



Note: All the components in the control logic drawing are at natural status.
The solenoid valve is not energized.

Pneumatic connection
Hydraulic connection
Electric connection

PARTS DESCRIPTION

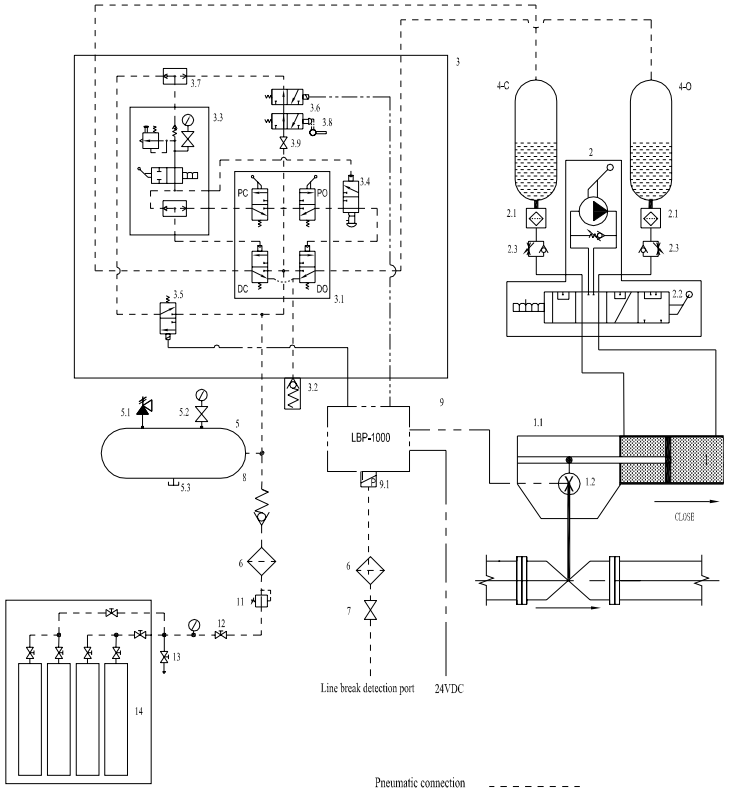
1 HYDRAULIC ACTUATING MECHANISM 1.1 SCOTCH-YOKE BOX 1.2 LIMIT SWITCH
HYDRAULIC HAND PUMP 2.1 HYDRAULIC FILTER 2.2 DIRECTION CONTROL VALVE 2.3 FLOW RATE ADJUSTING VALVE
PNEUMATIC CONTROL VALVES ASSEMBLY
.1 3/2 CONTROL SOLENOID VALVE 3.2 VENTING PORT 3.3 3/2 CONTROL GAS VENTING VALVE 3.4 MANUAL RESET PILOT VALVE 3.5 3/2 NC SOLENOID VALVE
GAS/HYDRAULIC TANK
GAS STORAGE TANK
GAS FILTER
CUT OFF VALVE
HIGH-PRESSURE SHUTTLE VALVE
LBP-1000 ELECTRONIC CONTROL UNIT 9.1 PRESSURE TRANSDUCER
NON-STANDARD OPTIONS: SOLAR PANEL, GAS REGULATOR, NITROGEN GAS BOTTLES UNIT, SELF-BOOSTING GAS SYSTEM ETC.

OPERATING INSTRUCTION

LOCAL CONTROL
PRESS LEVER ON VALVE 3.1 PO TO OPEN OR 3.1 PC TO CLOSE.
LINE BREAK OPERATION
A RATE OF PRESSURE DROP IN THE PIPELINE,OR THE DIFFERENTIAL PRESSURE IS HIGHER OR LOWER THAN THE PRESET VALUE, THE LBP TRIPS THE VALVE 3.5 TO INHIBIT OPEN OPERATION AND THE POWER VALVE 3.1C CAUSES THE ACTUATOR TO CLOSE. AFTER THE LINE BREAK INTERVENTION. THE INHIBITION VALVE 3.5 MUST BE MANUALLY RESET BEFORE THE ACTUATOR CAN BE REOPENED
REMOTE CONTROL
WHEN SOLENOID VALVE 3.1 PC/PO IS ENERGIZED, THE ACTUATOR WILL START TO CLOSE/OPEN. WHEN THE VALVE REACHES ITS FULLY CLOSED/OPEN POSITION, THE SOLENOID VALVE MUST BE DE-ENERGIZED.
MANUAL OPERATION
SELECTED BY THE VALVE 2.2 THE OPENING OR CLOSING OPERATION AND ACTUATE THE HAND PUMP 2 THE DIRECTIONAL CONTROL VALVE 2.2 MUST BE IN "AUTOMATIC" POSITION TO ALLOW THE OPERATION WITH GAS SUPPLY.

Draw No.	ZH6617	LOCAL CONTROL/MANUAL OPERATION LINE BREAK PROTECTION REMOTE CONTROL
Drawn by	-	Gas Over Oil Actuator Control Schematic
Approved	-	
Date	2012.05	

Technical Specification



Note: All the components in the control logic drawing are at natural status.
The solenoid valve is not energized.

Pneumatic connection
Hydraulic connection
Electric connection

PARTS DESCRIPTION

I DOUBLE-ACTING GAS OVER OIL ACTUATOR
.1 SCOTCH-YOKE BOX 1.2 ELECTRIC MICRO SWITCHES
HYDRAULIC MANUAL OVERRIDF.
.1 HYDRAULIC FILTER 2.2 HAND OPERATED DIRECTIONAL CONTROL VALVE 2.3 UNIDIRECTIONAL FLOW REGULATOR (ADJUSTABLE SETTING)
PNEUMATIC CONTROL VALVES ASSEMBLY
.1 3/2 CONTROL VALVE 3.2 VENTING PORT 3.3 3/2 CONTROL GAS VENTING VALVE 3.4 MANUAL RESET PILOT VALVE 3.5 3/2 NC SOLENOID VALVE 3.63/2 NO SOLENOID VALVE 3.7 HIGHER PRESSURE SHUTTLE VALVE 3.8 3/2 NO VALVE TO RESET FOR CAM AND SPRING
GAS-HYDRAULIC TANK
GAS STORAGE TANK 5.1 RELIEF VALVE 5.2 PRESSURE GAUGE 5.3 MANUAL DRAIN VALVE
MECHANICAL FILTER
CUT OFF VALVE
HIGHER PRESSURE SHUTTLE VALVE
LBP-1000 LINE BREAK PROTECTION 9.1 PRESSURE SENSOR
ROOT VALVE
I I PRESSURE REGULATING VALVE
NITROGEN INTERSECTION STOP VALVE
BLOWOFF VALVE
NITROGEN STATION

OPERATING INSTRUCTION

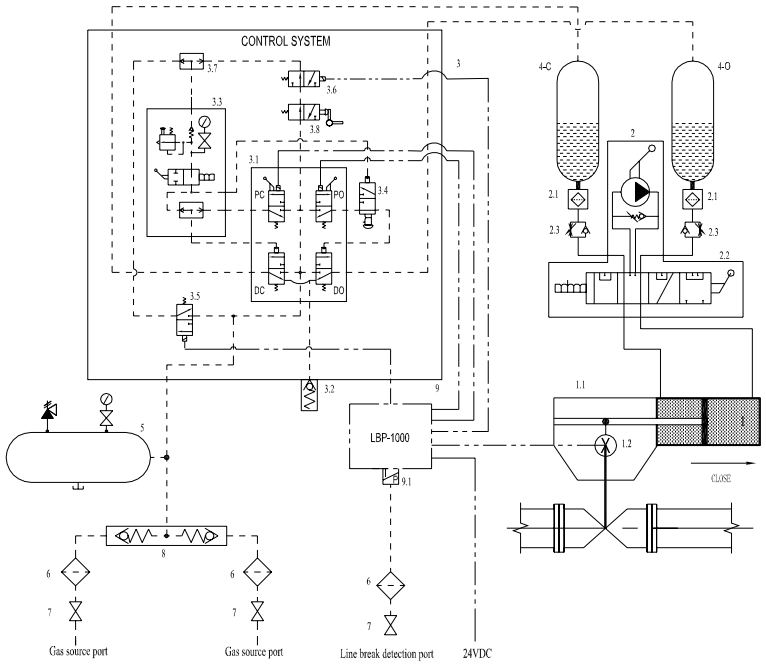
LOCAL CONTROL
PRESS LEVER ON VALVE 3.1 PO TO OPEN OR 3.1 PC TO CLOSE.

LINE BREAK OPERATION
A RATE OF PRESSURE DROP IN THE PIPELINE,OR THE DIFFERENTIAL PRESSURE IS HIGHER OR LOWER THAN THE PRESET VALUE, THE LBP TRIPS THE VALVE 3.5 TO INHIBIT OPEN OPERATION AND THE POWER VALVE 3.1C CAUSES THE ACTUATOR TO CLOSE. AFTER THE LINE BREAK INTERVENTION, THE INHIBITION VALVE 3.5 MUST BE MANUALLY RESET BEFORE THE ACTUATOR CAN BE REOPENED

ESD FAIL(FAIL SAFETY FUNCTION) CLOSE
SOLENOID VALVE 3.6 IS NO SOLENOID VALVE, ENERGIZE TO CLOSE. ONCE SYSTEM IS FAIL(DEENERGIZED),SOLENOID VALVE 3.6 IS OPENED, ACTUATOR SHUTDOWN,MEANWHILE VALVE 3.4 IS SELF-LOCKED, REQUIRING ON-SITE RESET, ACTUATOR WILL RETURN TO NORMAL OPERATING. WHEN ON-SITE 24DVC IS NOT READY, PLEASE CLOSE BY-PASS ESD) CONTROL VALVE FIRSTLY.

MANUAL OPERATION
SELECTED BY THE VALVE 2.2 THE OPENING OR CLOSING OPERATION AND ACTUATE THE HAND PUMP 2 THE DIRECTIONAL CONTROL VALVE 2.2 MUST BE IN "AUTOMATIC" POSITION TO ALLOW THE OPERATION WITH GAS SUPPLY.

Draw No.	ZH6618N	LOCAL CONTROL/MANUAL OPERATION LINE BREAK PROTECTION ESD CONTROL NITROGEN GAS SUPPLY
Drawn by	-	
Approved	-	Gas Over Oil Actuator Control Schematic
Date	2012.05	



Note: All the components in the control logic drawing are at natural status.
The solenoid valve is not energized.

Pneumatic connection
Hydraulic connection
Electric connection

PARTS DESCRIPTION

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HYDRAULIC HAND PUMP 2.1 HYDRAULIC FILTER 2.2 DIRECTION CONTROL VALVE 2.3 FLOW RATE ADJUSTING VALVE
PNEUMATIC CONTROL VALVES UNIT
.1 3/2 CONTROL SOLENOID VALVE 3.2 VENTING PORT 3.3 3/2 CONTROL GAS VENTING VALVE 3.4 MANUAL RESET PILOT VALVE 3.5 3/2 NC SOLENOID VALVE 3.63/2 NO SOLENOID VALVE 3.7 HIGHER PRESSURE SHUTTLE VALVE 3.8 3/2 NO VALVE TO RESET FOR CAM AND SPRING
GAS/HYDRAULIC TANK
GAS STORAGE TANK
GAS FILTER
BALL VALVE
HIGH-PRESSURE SHUTTLE VALVE
LBP-1000 ELECTRONIC CONTROL UNIT 9.1 PRESSURE TRANSDUCER
NON-STANDARD OPTIONS: SOLAR PANEL, GAS REGULATOR, NITROGEN GAS BOTTLES UNIT, SELF-BOOSTING GAS SYSTEM ETC.

OPERATING INSTRUCTION

LOCAL CONTROL
PRESS LEVER ON VALVE 3.1 PO TO OPEN OR 3.1 PC TO CLOSE
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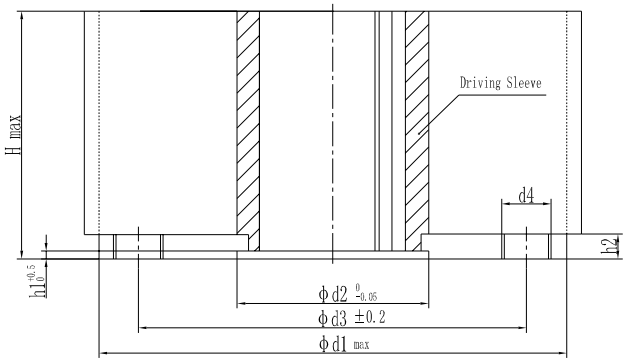
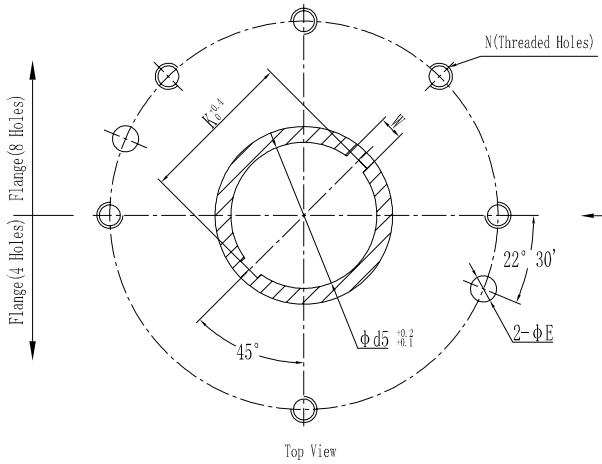
DVC IS NOT READY, PLEASE CLOSE BY-PASS EST) CONTROL VALVE FIRSTLY.
REMOTE CONTROL
WHEN SOLENOID VALVE 3.1 PC IS ENERGIZED, THE ACTUATOR WILL START TO CLOSE THE VALVE. WHEN THE VALVE REACHES ITS FULLY CLOSED POSITION, THE SOLENOID VALVE MUST BE DE-ENERGIZED.
MANUAL OPERATION
SELECT BY THE VALVE 2.2 THE OPENING OR CLOSING OPERATION AND ACTUATE THE HAND PUMP 2 THE DIRECTIONAL CONTROL VALVE 2.2 MUST BE IN "AUTOMATIC" POSITION TO ALLOW THE OPERATION WITH GAS SUPPLY.

Draw No.	ZH6619	LOCAL CONTROL/MANUAL OPERATION LINE BREAK PROTECTION ESD CONTROL REMOTE CONTROL
Drawn by	-	
Approval	-	Gas Over Oil Actuator Control Schematic
Date	2012.05	

Technical Specification





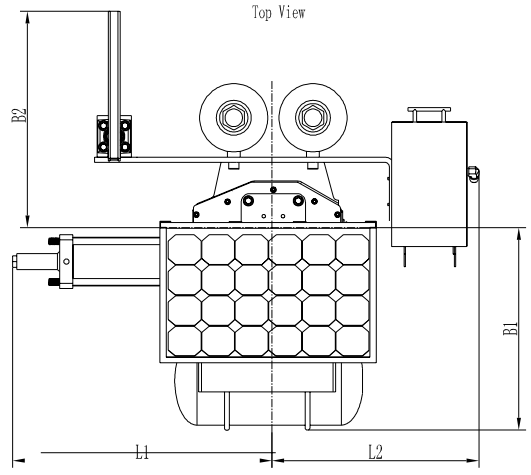
Note
1″ All dimension unit is "mm"#
2″ Quantity and size of threaded holes comply with ISO 5211.
3″ Connecting Screws and pins are all blind-hole.
4″ From top view the keyway direction shows when actuator is open.

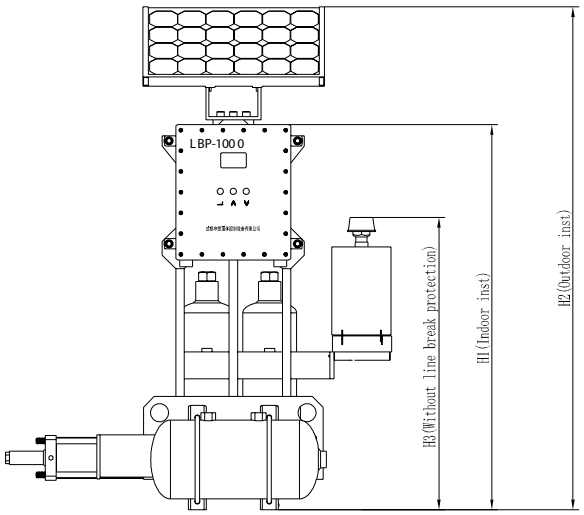
Actuator is at fully open position.

GDO-60	520	254	406	M36	8	7	35	268	200	28	212.8	30(depth 24)	
GDO-30	430	195	356	M30	8	5	25	200	157	25	167.8	25(depth 20)	
GDO-15	360	150	298	M20	8	5	20	190	112	18	120.8	20(depth 15)	
GDO-09	310	127	254	M16	8	6	19	130	86	14	93.6	20(depth 15)	
GDO-06	240	105	165	M20	4	5	19	127	70	12	76.3	20(depth 15)	
Model No.	φd1	φd2	φd3	d4	N	h1	h2	Hmax	φd5	W	K	φE	

Drawn	KS.Liao	Dimensions for Actuator Adaptation	Drawing No. ZH GDO-100613-01
Check	J.Lee		
Date	2010.06		

Dimensions for Gas Over Oil Actuators





Dimensions:

Model No.	L1	L2	B1	B2	H1	H2	H3	weight	Torque
GDO-06	600	500	450	500	1150	1450	820	380	9000
GDO-09	650	550	525	505	1200	1520	900	490	13500
GDO-15	820	550	575	480	1170	1540	970	580	22500
GDO-30	1100	600	550	750	1250	1600	1080	790	45000
GDO-60	1200	600	600	850	1300	1650	1150	950	90000
GDO-100	1400	700	1100	700	1400	1700	1600	1400	150000
GDO-200	1700	1000	1100	650	1700	1700	1700	2100	300000

Note
1、Dimension unit:mm, weight unit:kg, torque unit:Nm.
2、Double cylinder actuator:L2 = L1。

Product Test


Torque and stroke test benches

Selectiona nd Check

Selectiono fg as over oila ctuatorm ainlyc oncernst he output torque of itsm echanism at lowa nd high pipeline pressure.T hus, ourc ustomers hall providev alve' st orqued ataf or high andl ow pipeline pressure.


Testing

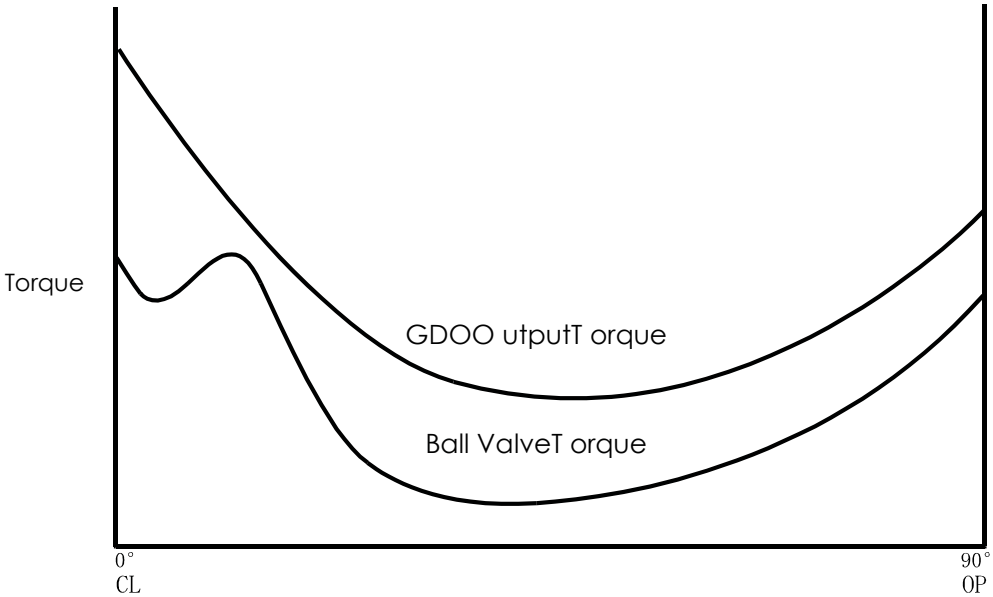
Selection:

- safety factor of gaso vero il actuator to valves hall be nol esst han1 .7,c overing valve' sw hole stroke.

Check:

- gaso vero il actuator must go through1 00%t orquet estb eforel eaving factory;
- gaso vero il actuator must go through1 00%s troket estb eforel eaving factory.

Factoryt esting



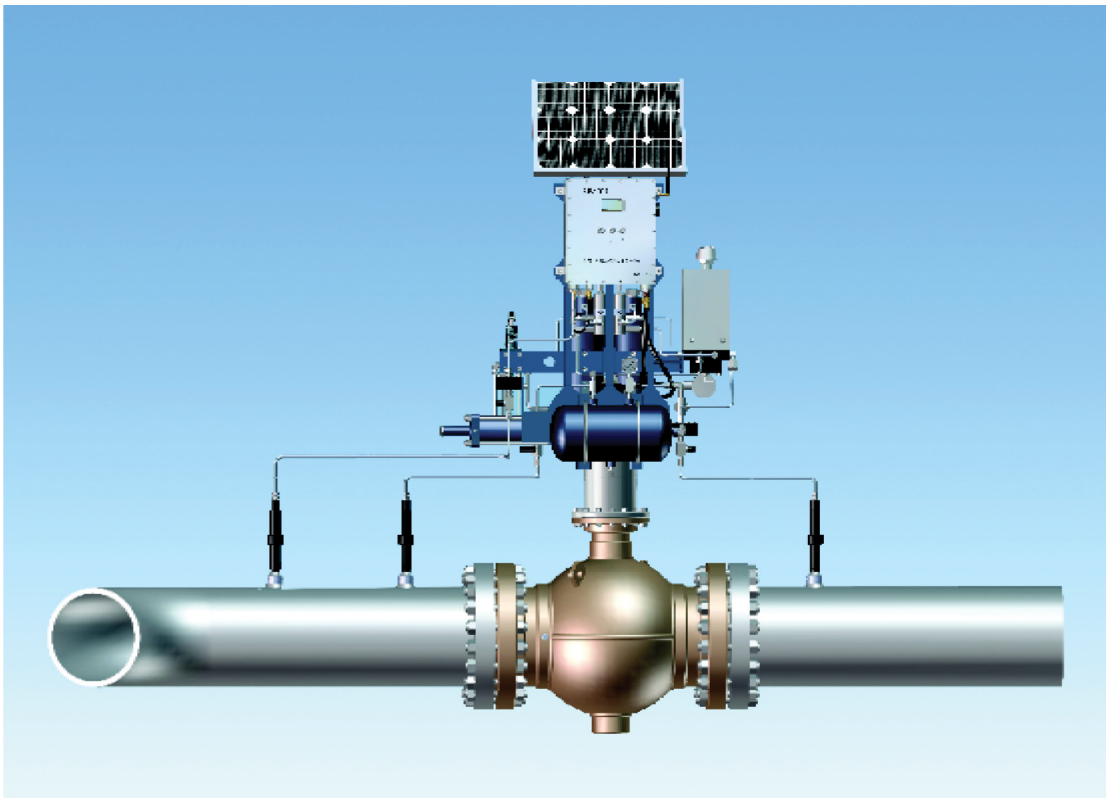
LBP-1000 Operation

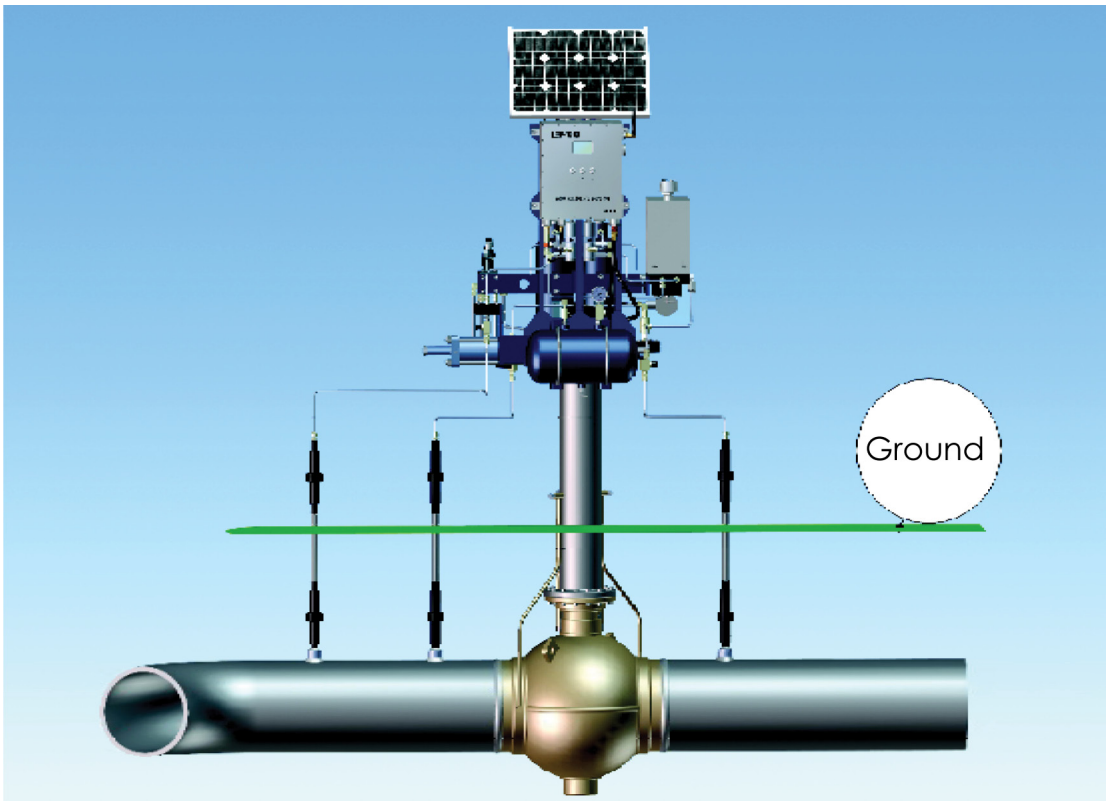
Settings of System's Main Parameters

Items	Setting Range	Default Value	Notes
Valve Control High-pressure Limit-Bar	000.0~399.9	100.0	Please make adjustment according to the pipeline design and its running status, and refer to pipeline running extreme value records.
Valve Control Low-pressure Limit-Bar	000.0~399.9	0.0	
Valve Control PDR-Bar/min	00.0~29.9	8.0	
Fluctuation PDR-Bar/min	00.0~29.9	6.0	
Fluctuation High-pressure Limit-Bar	000.0~399.9	80.0	
Fluctuation Low-pressure Limit-Bar	000.0~399.9	20.0	
Valve Action Delay-Second	000~999	40	According to Pipelines Fluctuations & Valve s Parameters
Valve Action Time-Second	00~99	30	
Sampling Rate-Second	00~99	5	
Hour:Minute:Second	24 Hours System	Date of Ex-works	
Year-Month-Day	00-01-01~99-12-31		
Working Mode	ACQ, ACQ+VC	ACQ	recording; while ACQ+VC mode is able to control valverecording; while ACQ+VC mode is able to control valve
Batter Under-voltage Alarm-V	00.0~49.9	10.8	For the Management & Maintenance of Battery
Battery Over-voltage Alarm-V	00.0~49.9	14.3	
Last Date of Battery Replacement	00-01-01~99-12-31	Date of Ex-works	
Next Date of Battery Replacement	00-01-01~99-12-31	3 Years Later	
Equipment Number	00000000~99999999	Ex-works Serial Number	
20mA->Pressure (Bar)	000.0~399.9	100.0	Pressure Sensor Rating
4mA->Pressure (Bar)	000.0~399.9	0.0	
Calculating Interval of PDR (Point)	01~09	9	

To help you set the parameters, LBP-1000 has records of the maximum pressure value, minimum pressure value, and maximum PDR value of the pipeline since the last time when the system cache is cleared. All the records are displayed on the fourth page in menu M1, and please refer to the instructions in the local operation menu. We recommend that you set the values of an increase or decrease amount of 10% (sensitive), 20% (normal), and 30% (slow) to the relevant records as the parameters. Customers can also set the parameters according to your own experiences or the requirements of operating the pipeline.

Installation





Required for quotation

1. Environment : temperature, weather and so on

2. Indoor/outdoor installation

3. Power source : 24 VDC or solar energy etc;

4. Valve Torque of pipe line's max pressure

5. valve stem's maximum allowable torque

6. Remote and local control & communication requirements

djc **DAEJU CONTROL CO., LTD**

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