



Exploration & Production

GENERAL SPECIFICATION

INSTRUMENTATION

GS INS 137

Design and supply of on/off valve control panels

01	10/04	Revised as per marking
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Rev.	Date	Notes

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1. Scope

This document defines the minimum requirements for the design, construction and supply of on/off valve control panels for Total Exploration & Production facilities, onshore and offshore.

2. Reference documents

The reference documents listed below form an integral part of this General Specification. Unless otherwise stipulated, the applicable version of these documents, including relevant appendices and supplements, is the latest revision published at the EFFECTIVE DATE of the CONTRACT.

Standards

Reference	Title
IEC 60079 - parts 0 to 14	Electrical apparatus for explosive gas atmospheres
IEC 60529	Degrees of protection provided by enclosures (IP code)

Professional Documents

Reference	Title
API RP 14C	Recommended Practice for Analysis, Design, Installation, and Testing of Basic Surface Safety Systems for Offshore Production Platforms
API RP 552	Transmission Systems

Regulations

Reference	Title
Not applicable	

Codes

Reference	Title
Not applicable	

Other documents

Reference	Title
Not applicable	

Total General Specifications

Reference	Title
GS ELE 031	Design of earthing and bonding systems
GS INS 101	Instrumentation engineering, supply and construction general requirements
GS INS 102	Instrumentation identification
GS INS 104	Design of the generation and distribution of instrument air or gas
GS INS 107	Design and installation of instrumentation links
GS INS 146	Design of generation and distribution of hydraulic energy
GS INS 900	Instrument hook-up diagrams
GS PVV 112	Piping material classes
GS PVV 211	Design and fabrication of pressure vessels according to ASME VIII
GS SAF 261	Pressure protection and relief, emergency shutdown and depressurization

3. Definitions

Wellhead safety valves are not part of this specification.

The safety systems mentioned here below and in attached drawings are those to which safety valves are generally assigned to. Nevertheless, this must be confirmed by project documents.

3.1 ESDV

Emergency ShutDown Valve: high integrity shutdown valve, generally Fail to Close, controlled by the Safety Shutdown System (SSS).

3.2 SDV

ShutDown Valve: shutdown valve, generally Fail to Close and controlled by the Process Safety System (PSS).

3.3 BDV

BlowDown Valve: automatically operated valve, Fail to Open, generally controlled by the SSS.

3.4 XV

Process on/off valve controlled from the Process Control System (PCS).

4. Functional requirements

4.1 Generalities

Safety valves control devices shall be designed as normally energized.

Failure of any component in safety valves control panels should set the controlled actuator to a safe 'fail to' position.

The valve control panels shall enable the controls as described below:

	ESDV	SDV	BDV	XV
Control signal failure action	Close	Close	Open	(1)
Power fluid failure action	Close	Close	Open	(1)
Open/Close local command	Yes	Yes	Yes	(1)
Local Reset after ESD	Yes	No	Yes (2)	No
Partial stroking facility	Yes	Yes (1)	No	No
ESD signal test facility	Yes	Yes (1)	Yes	No
Open remote control	No	(1)	Yes (3)	Yes
Close remote control	Yes	(1)	No (2)	Yes

(1) as per project requirements.

(2) automatic reset or reset from control room may be envisaged in specific cases.

(3) interlocked with "permissive" to blow down operations

For more details about on/off safety valves functional requirements and accessories, see [GS SAF 261](#).

NOTES: Samples of typical functional schematic drawings are given in appendix 1.

These do not show all possible combinations of functions.

Supplier shall perform the necessary detail engineering to achieve project requirements and produce the final construction documents.

4.2 Control functions

4.2.1 Remote Control

Valves shall be remotely controlled by means of solenoid controlled pilot valves.

Solenoid valves will be monostable; pilots will be 3-way/2-position for single acting actuators and 5-way/2-position for double acting actuators.

Except for double acting 'stay put' XV's, valves shall move to their safety or 'fail to' positions in case control signal, electrical power supply or power fluid is lost.

4.2.2 Local Reset

ESDV's must be reset locally before valve may be open by the SSS.

A "RESET" pushbutton, electrical, shall be installed onto the panels. The signal shall be linked to the SSS.

4.2.3 Local Control

4.2.3.1 Safety valves:

A manual "OPEN/CLOSE" device shall be available. It shall directly act on the power fluid circuitry and shall be lockable in the safety position.

Demand for moving the valve to its safety position shall always override the command from the safety system.

Moving the valve from its safety position shall only be possible if the safety system controlled pilot is energized.

4.2.3.2 Process valves:

The need for a local control device and the type of control shall be specified in the datasheet.

For double acting 'stay put' XV's, the local command shall override the command from the remote automatic system.

For XV's having a 'fail to' position, the demand to move the valve to this 'fail to' position shall always have priority whether it is local or remote.

4.2.4 Partial Stroke Testing

The partial stroke testing function shall be available for ESDV's and possibly for SDV's upon project SIL requirements.

The principle is to stroke the valve over a range of 15% to 20% and monitor relevant parameters.

During the partial stroke test, the shutdown signal coming from the safety system shall remain operational.

4.2.4.1 'Smart' system:

Preference shall be given to 'smart' type devices with enhanced diagnostic capabilities to monitor the valve performance.

Valve test shall be automatically initiated by the 'smart' device; test frequency shall be adjustable.

Essential performance parameters shall be processed into the 'smart' device so as to generate diagnostic warnings and test logs to the safety system.

4.2.4.2 Manual system:

An alternative solution is to have a manually initiated partial stroke testing system with limit switches. Stroke time is monitored by the related safety system.

Safeguard and interlocks shall be provided to prevent full valve closure on limit switch failure or wrong operation.

A key locked switch with two (2) positions, "NORMAL" and "PARTIAL STROKING", spring return to the "NORMAL" position, shall be available at the panel. The key shall be non-removable in the "PARTIAL STROKING" position.

This solution shall not be used for quick closing valves.

4.2.5 Solenoid Valve Test

Safety valves control panels shall provide the capability for testing the signal from the safety system.

4.2.5.1 'Smart' system:

This function can be included within the same 'smart' device as the partial stroking.

4.2.5.2 Manual system:

As an alternative, a manual system, based on a key locked switch, can be installed for solenoid test purpose.

The switch shall have two (2) positions: "NORMAL" and "ESD OVERRIDE". It shall be spring return to the "NORMAL" position and the key shall be locked in the "ESD OVERRIDE" position.

In the "ESD OVERRIDE" position the solenoid controlled pilot shall be bypassed so as to allow the solenoid to be de-energized without moving the valve to its safety position.

The signal downstream of the solenoid valve is monitored by means of a pressure gauge.

A "TEST" status shall be sent to the relevant safety system by means of a pressure switch. Electrical contact shall be Single Pole Double Throw (SPDT).

4.2.6 Travel Speed Adjustment

Unless otherwise specified by COMPANY in project documents, the control panels shall provide the capability of adjusting valves closing and opening speeds.

4.2.7 Double Acting Actuators

All safety valves with double acting actuators shall be fitted with a reserve vessel.

Fire proofing of the reserve vessel and links to the actuator shall be required.

This vessel shall be sized to allow three (3) strokes of the valve, considering the initial pressure can be the fluid minimum available pressure as specified in the datasheet.

The pressure vessel shall be installed on the closing circuit for 'Fail to Close' valves (resp. 'opening' and 'Fail to Open'), as close as possible to the valve, and accessible for maintenance.

Hydraulic accumulators shall be bladder type and shall comply with **GS PVV 211**. They shall be connected by means of a double block and bleed valve assembly, and shall be fitted with nitrogen pressure monitoring and refilling system.

Pneumatic reserve tanks shall be fitted with draining facility.

5. Construction requirements

5.1 Generalities

The control panels should normally be supplied with the actuators; they shall be designed to be mounted on the valve itself or as close as possible to the valve.

The control panels shall incorporate all function required for control, except the pressure vessel.

Distributors, solenoid valves and, more generally, all components and links shall be sized and selected to meet all valve opening and closing time criteria.

All components shall be corrosion resistant and IP 65 rated. Metallic parts shall be stainless steel AISI 316 at the minimum.

If instrument gas is used, wetted parts of all components shall be suitable with the gas composition, taking into account all chemical products (methanol, corrosion inhibitor,...) injected in the gas.

Electrical components shall be ATEX certified for use in the area they will be installed.

Solenoid valves shall be of the low energy consumption type, 10 W maximum. Operating voltage shall be 24 VDC except otherwise specified in the instrument datasheet. Solenoid valves coils shall incorporate surge suppression diodes.

5.2 Safety Integrity Level (SIL)

As part of a loop the valve control panel shall meet the SIL requirements for the system the valve belongs to. This level shall be specified in the valve datasheet.

This applies to the panel design and to the selection of the components.

When the SIL certification is not available for the whole panel, the supplier shall submit SIL calculation notes, approved by a certified third party, taking into account components individual data.

5.3 Construction details

All components shall be mounted on a 316L stainless steel plate; screws, boltings and all mounting accessories shall be 316 SS.

A pressure regulator/filter and a pressure gauge shall be installed at power fluid input.

Check valve(s), bubble tight type, shall be installed downstream of the regulator.

A pressure gauge is to be installed to monitor the actuator supply at panel output.

All tubes and cables shall be routed from the bottom of the panel. Tubes shall be secured to the plate using hydrophobic blocks.

The hydraulic pilots drain lines shall be piped to a common return header.

The pneumatic pilots vents shall be fitted with exhaust silencers.

The instrument gas vents shall be collected and piped to an external vent header.

A compact design reducing the number of links and unions shall be encouraged. With this aim, machined integrated manifold blocks can be used subject to COMPANY approval.

The plate shall be fitted with a canopy to protect components from rain falls or dropped objects.

In special cases when the panel is highly exposed to water or dirty fluids projections or when shocks are expected, the plate shall be enclosed in a 316L SS cabinet; the cabinet shall be IP 55 rated; dimensions shall be such that all components can be easily accessed for maintenance operations.

The cabinet shall be equipped with a breather.

Tubes penetrations inside the cabinet shall be through bulkhead connectors in the bottom plate.

Cables penetration shall be through cable glands in the bottom plate. Cables shall be protected from oil stagnating inside the cabinet.

A hole shall be drilled in the bottom plate to allow liquids to drain out; it shall have a screwed plug secured to the cabinet with a stainless steel chain.

Local control and monitoring devices shall be mounted in the cabinet front door. The links between the door and the inside shall be flexible and made from materials suitable with the nature and pressure range of the carried fluid. These links shall be carefully arranged, tied together in a bundle and long enough to prevent them being trapped by the movement of the door.

5.4 Labelling and marking

All panel instruments shall be tagged and identified according to the principles set out in **GS INS 101** and **GS INS 102**.

Local commands devices shall be clearly labelled; command modes and operation shall be described on an engraved plate close to each device:

- for ESDV's and SDV's, manual control shall be identified as "MANUAL CLOSE CONTROL"; the closed position shall be labelled "CLOSED" and the other position shall be identified as "AUTO".
- for BDV's, manual control shall be identified as "MANUAL OPEN CONTROL"; the open position shall be labelled "OPEN" and the other position shall be identified as "AUTO".
- for XV's, the same principle shall be adopted with the marking depending on the valve fall back position.

6. Special cases

ESDV's may be installed on pipelines with cathodic protection. These ESDV's must be electrically insulated from the rest of the installation.

In such cases, the control panels will preferably be mounted remote from the valves. The links between the valves and the panels shall therefore be via insulated flexible hoses.

7. Inspection and Testing

All actuators, local control panels and pressure vessels shall be subject to Factory Acceptance Test (FAT) by **VENDOR** and witnessed by **CONTRACTOR**.

The actuators shall be presented for FAT assembled to the valve, with all specified accessories and a hydraulic supply connected, and with specified line pressures applied to the valve.

The **VENDOR** shall be responsible for supplying and implementing all necessary equipment and accessories to demonstrate the panel provides the required service.

At the end of the FAT, panels shall be blown, dried, and all bulkhead connections shall be plugged.

VENDOR shall provide full details of the test procedure at bid stage.

No FAT shall be performed before **VENDOR** documents are approved by **CONTRACTOR**. Prior to submitting for FAT, **VENDOR** shall have performed full factory testing and inspection to confirm that the equipment meets purchase specifications.

FAT shall include, but may not be limited to:

- a) Visual inspection of quality, workmanship, layout, labels, paint finish etc....
- b) Full functional test of actuator (fail safe position, closing/opening time, opening/closing torque values at min/max supply pressure, maximum allowable working pressure facilities), and accessories including operation of the Local control station.
- c) Functional tests of each actuated valve fully integrated with its dedicated actuator and local control station. These tests shall be performed at full valve differential pressure and at minimum and maximum hydraulic supply pressure.

The following requirements shall be recorded during these tests:

- Full valve differential pressure
- Minimum hydraulic supply pressure
- Maximum hydraulic supply pressure
- Closing / opening stroke times
- Closing / opening torque valves

Minimum test and sequence requirements are included on the valve/actuator functional test check list attached in appendix 2 and shall be performed during FAT.

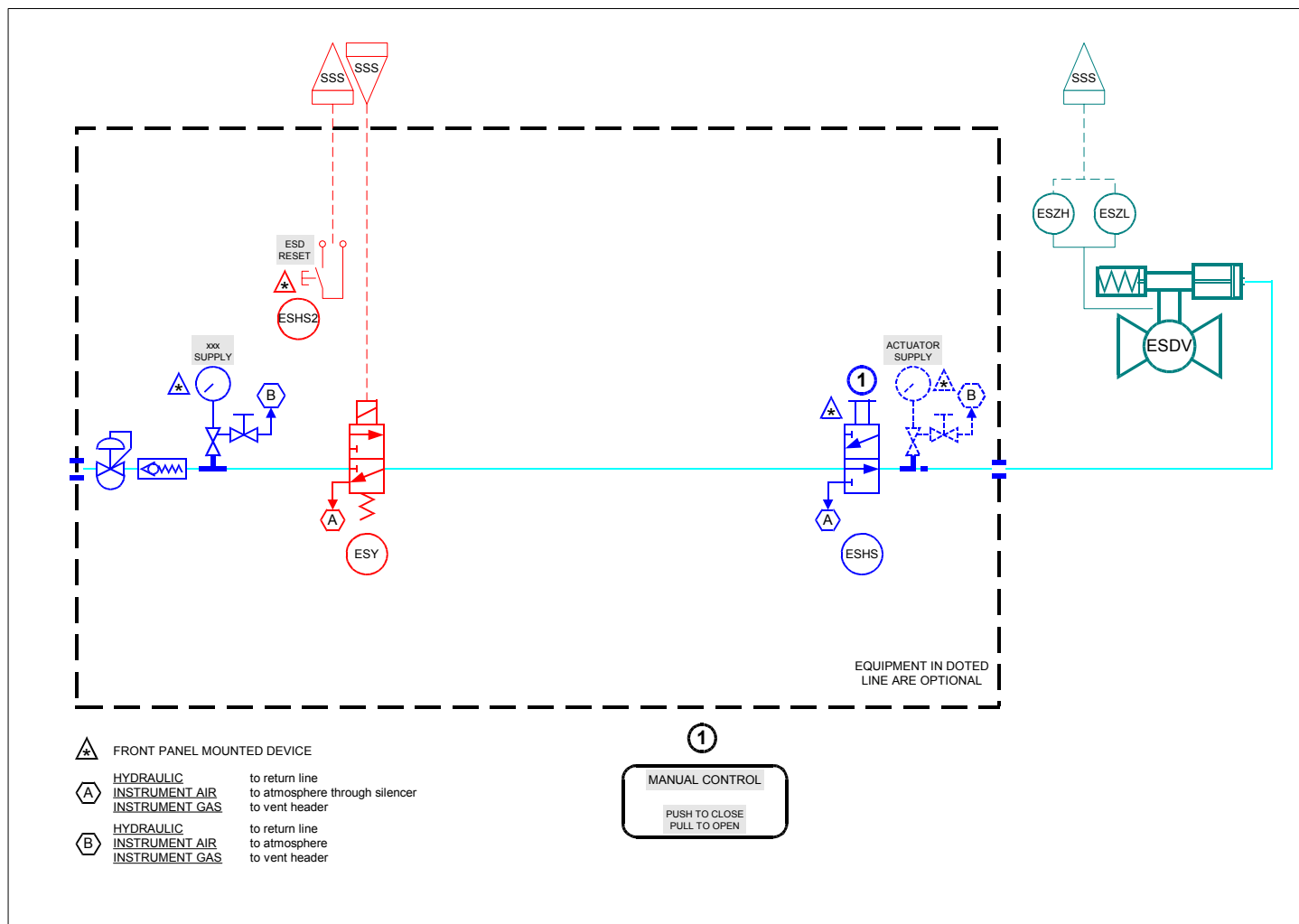
Appendix 1 On/Off Valves Functional Drawings

(SAMPLES FOR INFORMATION ONLY)

Typical No	Rev.	Description
101	01	ESDV Single Acting
102	01	ESDV Single Acting + Solenoid Valve Test
103	01	ESDV Single Acting + Partial Stroke Testing
104	01	ESDV Single Acting + Solenoid Valve Test + Partial Stroke Testing
105	01	ESDV Single Acting + PSS Control
106	01	ESDV Single Acting + Solenoid Valve Test + Partial Stroke Testing + PSS Control
151	01	ESDV Double Acting
201	01	SDV Single Acting
202	01	SDV Single Acting + Solenoid Valve Test
203	01	SDV Single Acting + Partial Stroke Testing
204	01	SDV Single Acting + Solenoid Valve Test + Partial Stroke Testing
205	01	SDV Single Acting + PCS (or UCP) Control
206	01	SDV Single Acting + Solenoid Valve Test + Partial Stroke Testing + PCS (or UCP) Control
251	01	SDV Double Acting
301	01	BDV Single Acting
302	01	BDV Single Acting + Solenoid Valve Test
311	01	BDV Single Acting + Local Reset
312	01	BDV Single Acting + Solenoid Valve Test + Local Reset
351	01	BDV Double Acting
361	01	BDV Double Acting + Local Reset
401	01	XV Single Acting
402	01	XV Single Acting + Local Control
451	01	XV Double Acting – ‘Stay Put’
452	01	XV Double Acting – ‘Fail to Close’
453	01	XV Double Acting – ‘Fail to Close’ + Local Control

TYPICAL 101:

ESDV – SINGLE ACTING



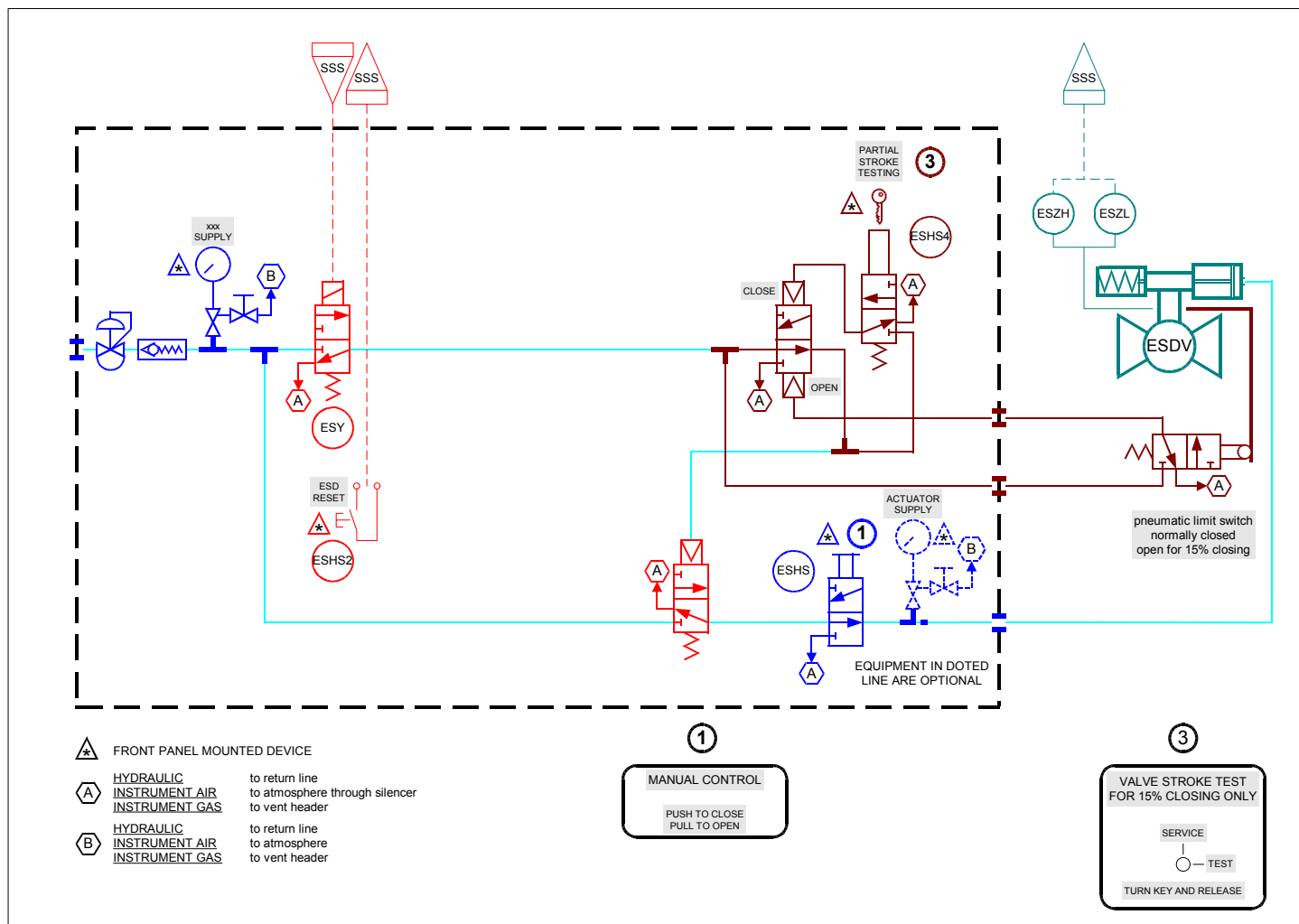
+ SOLENOID VALVE TEST



TYPICAL 103:

ESDV – SINGLE ACTING

+ PARTIAL STROKE TESTING

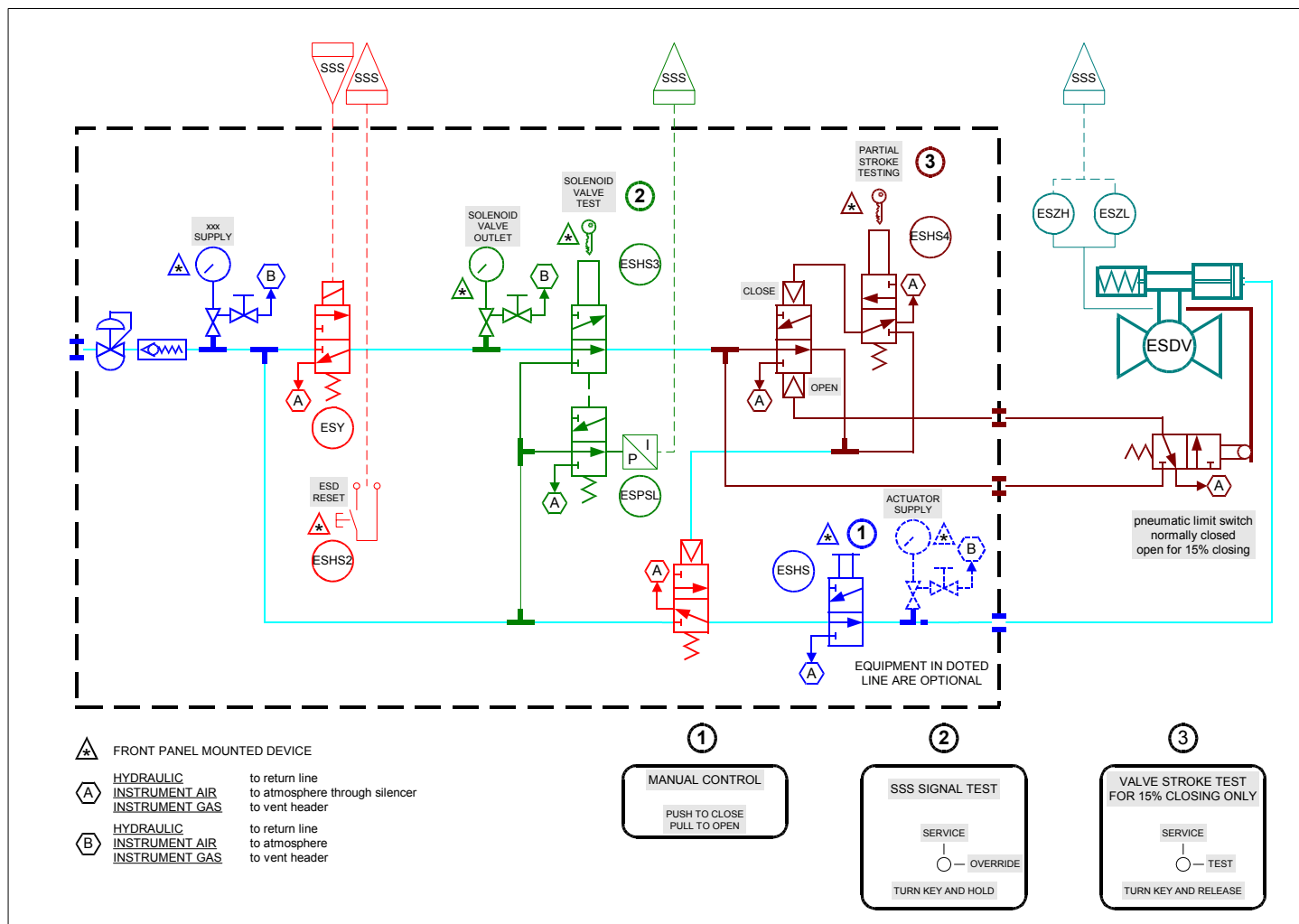


TYPICAL 104:

ESDV – SINGLE ACTING

+ SOLENOID VALVE TEST

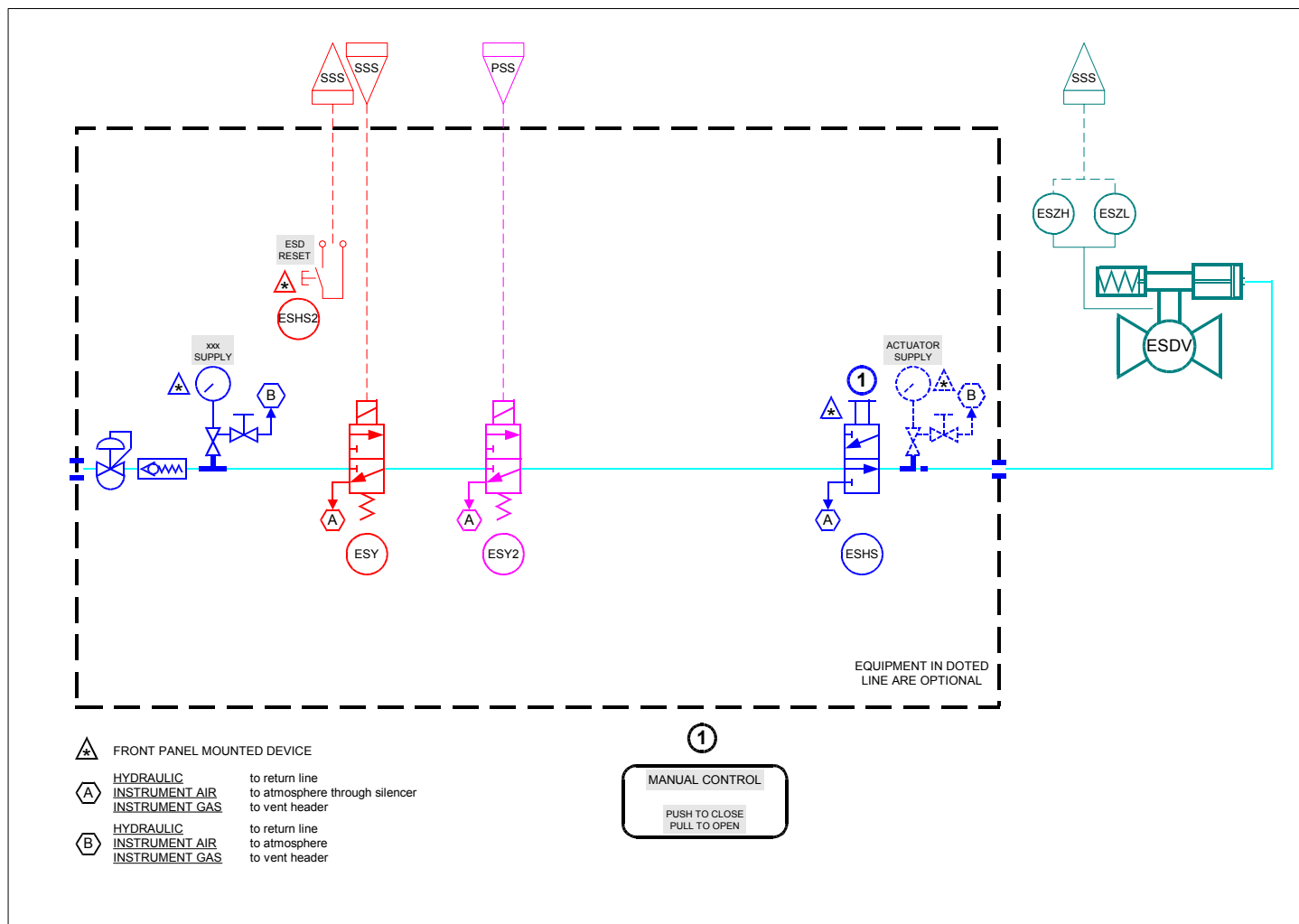
+ PARTIAL STROKE TESTING



TYPICAL 105:

ESDV – SINGLE ACTING

+ PSS CONTROL



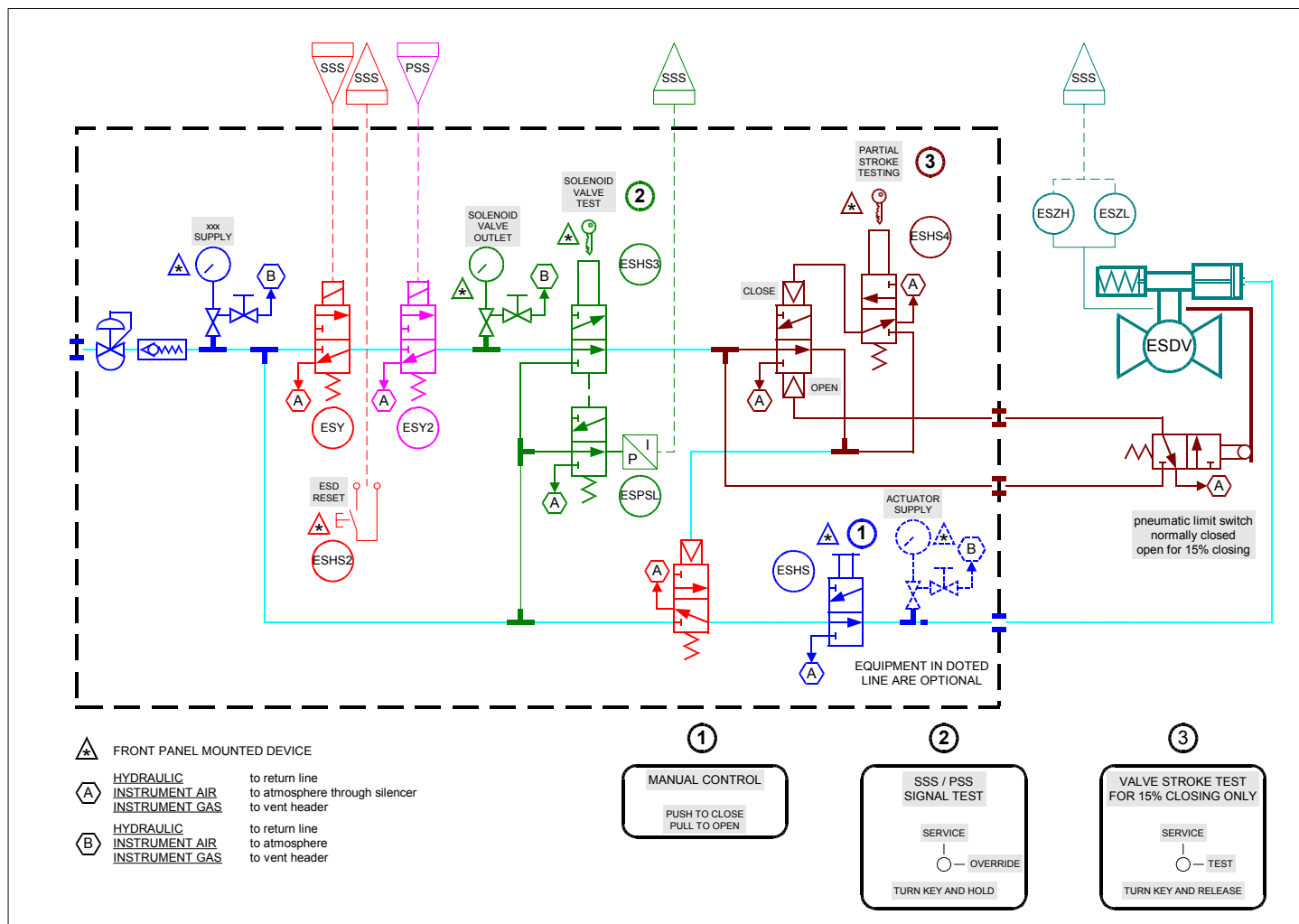
TYPICAL 106:

ESDV – SINGLE ACTING

+ SOLENOID VALVE TEST

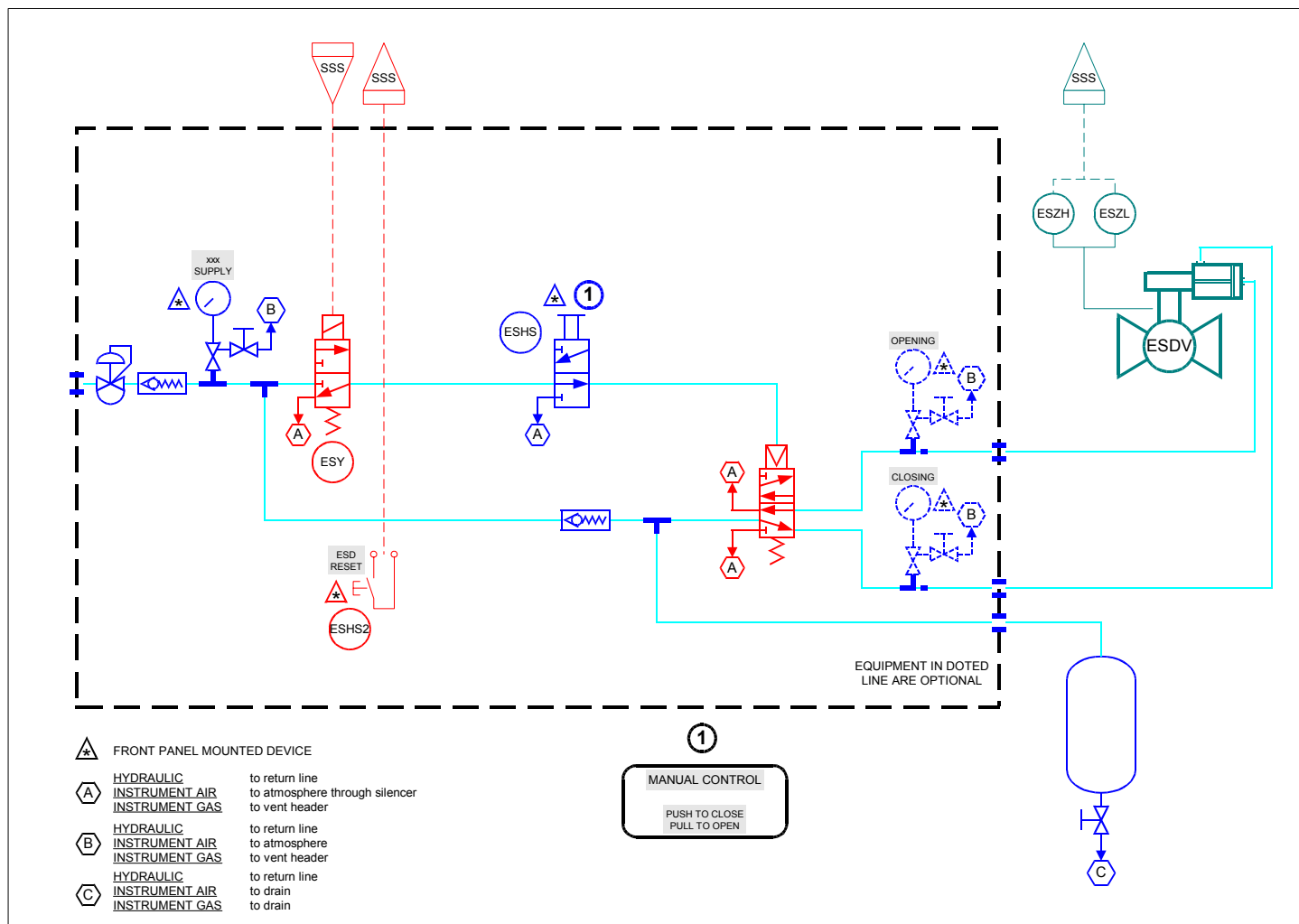
+ PARTIAL STROKE TESTING

+ PSS CONTROL



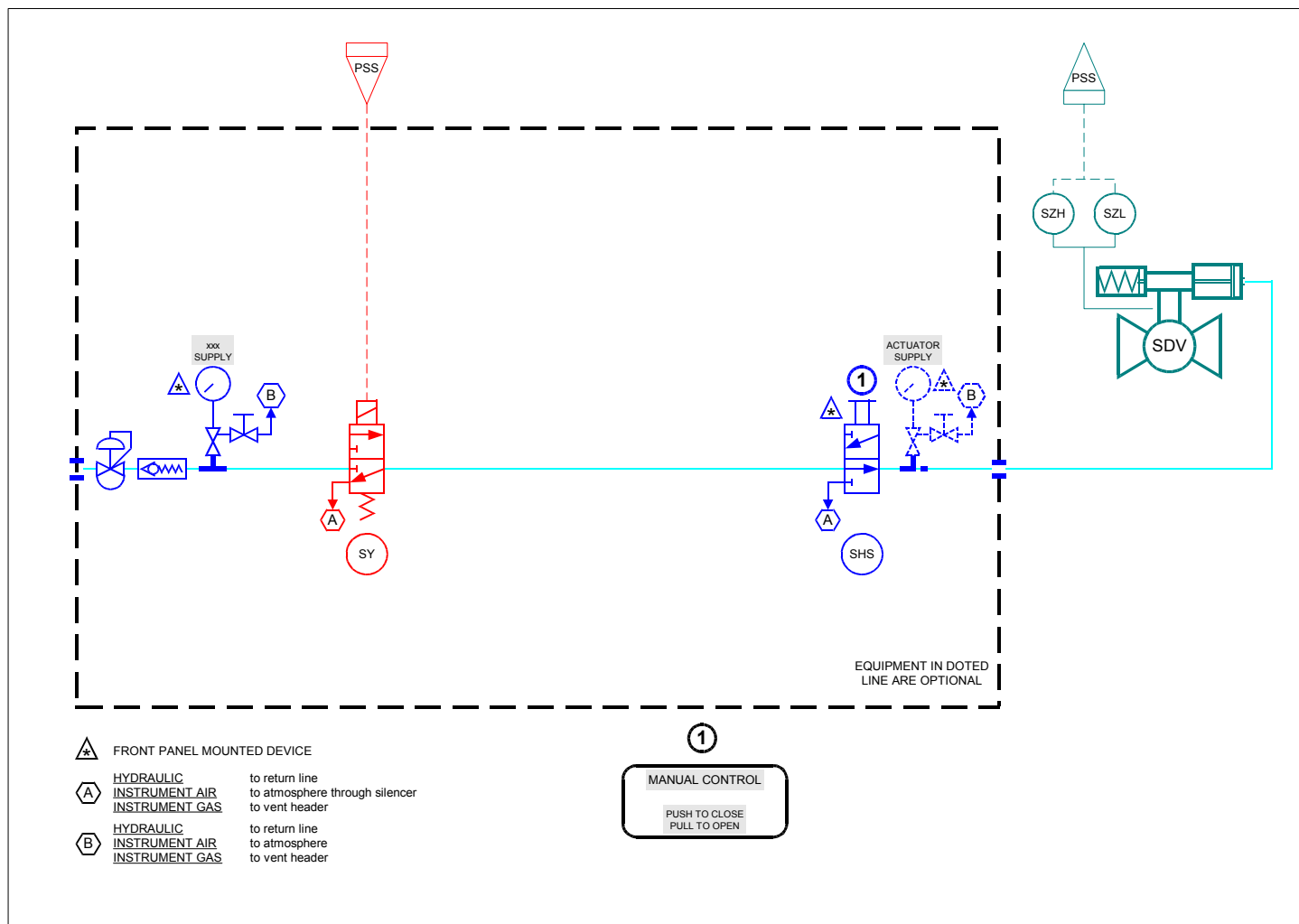
TYPICAL 151:

ESDV – DOUBLE ACTING



TYPICAL 201:

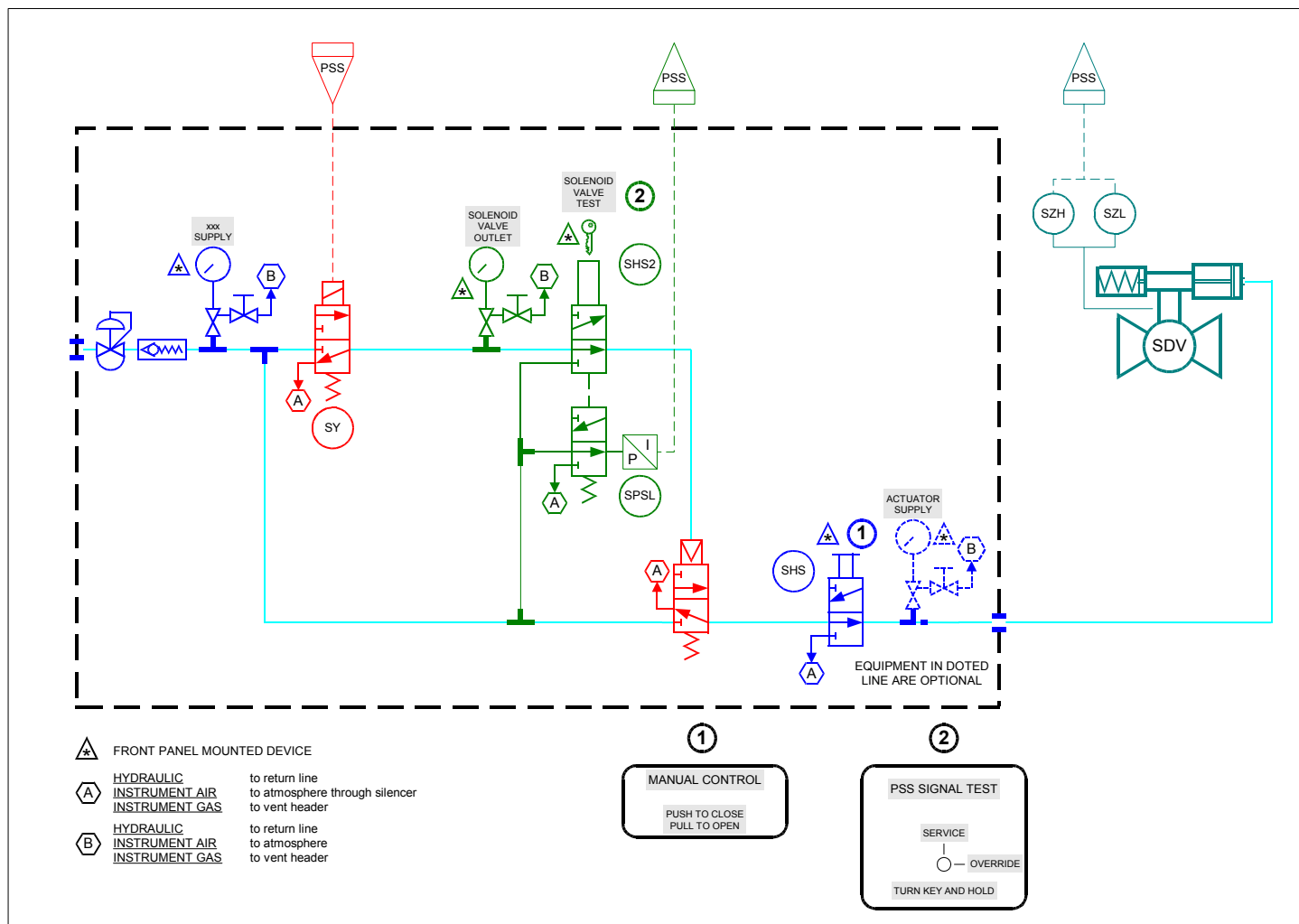
SDV – SINGLE ACTING



TYPICAL 202:

SDV – SINGLE ACTING

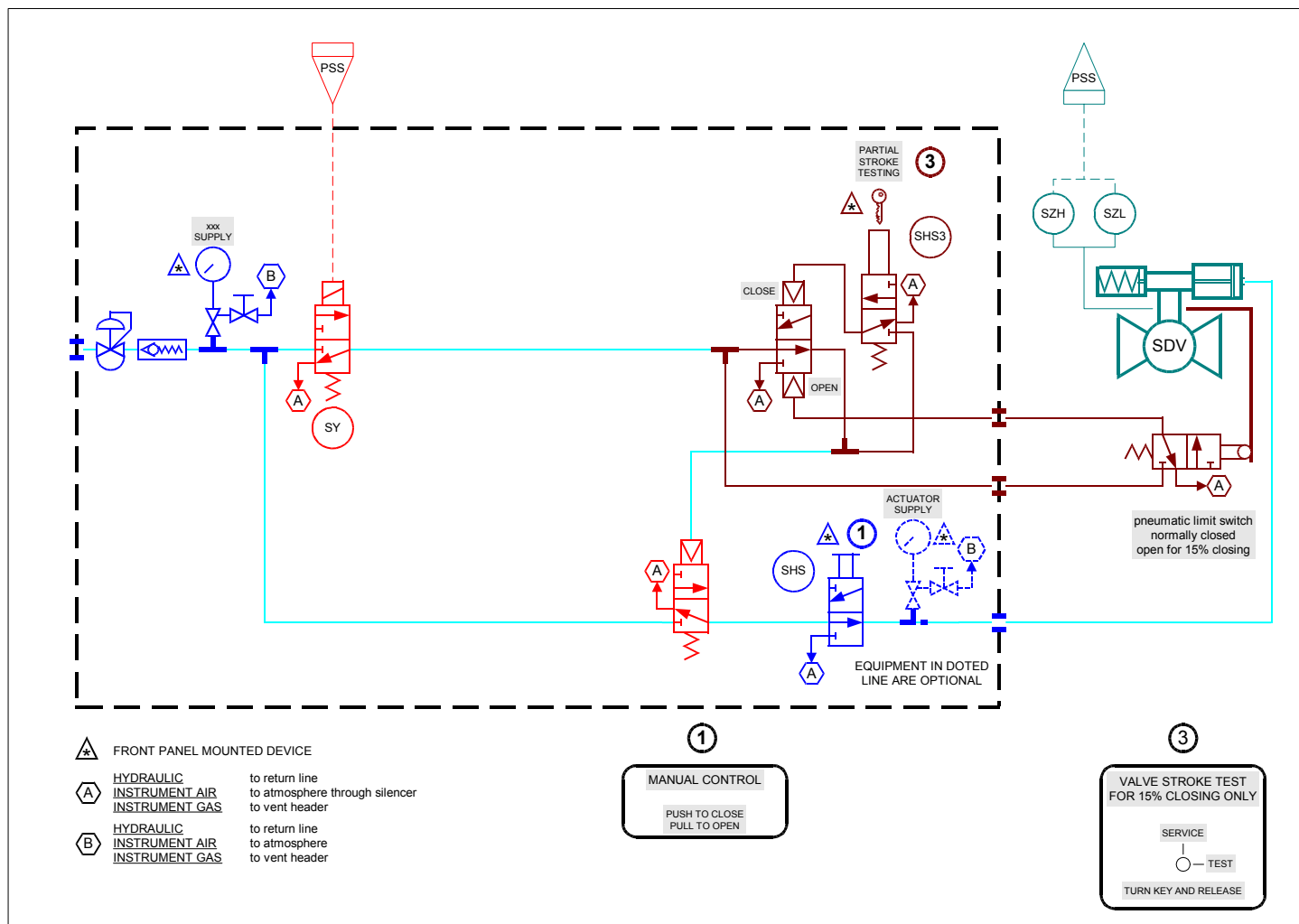
+ SOLENOID VALVE TEST



TYPICAL 203:

SDV – SINGLE ACTING

+ PARTIAL STROKE TESTING

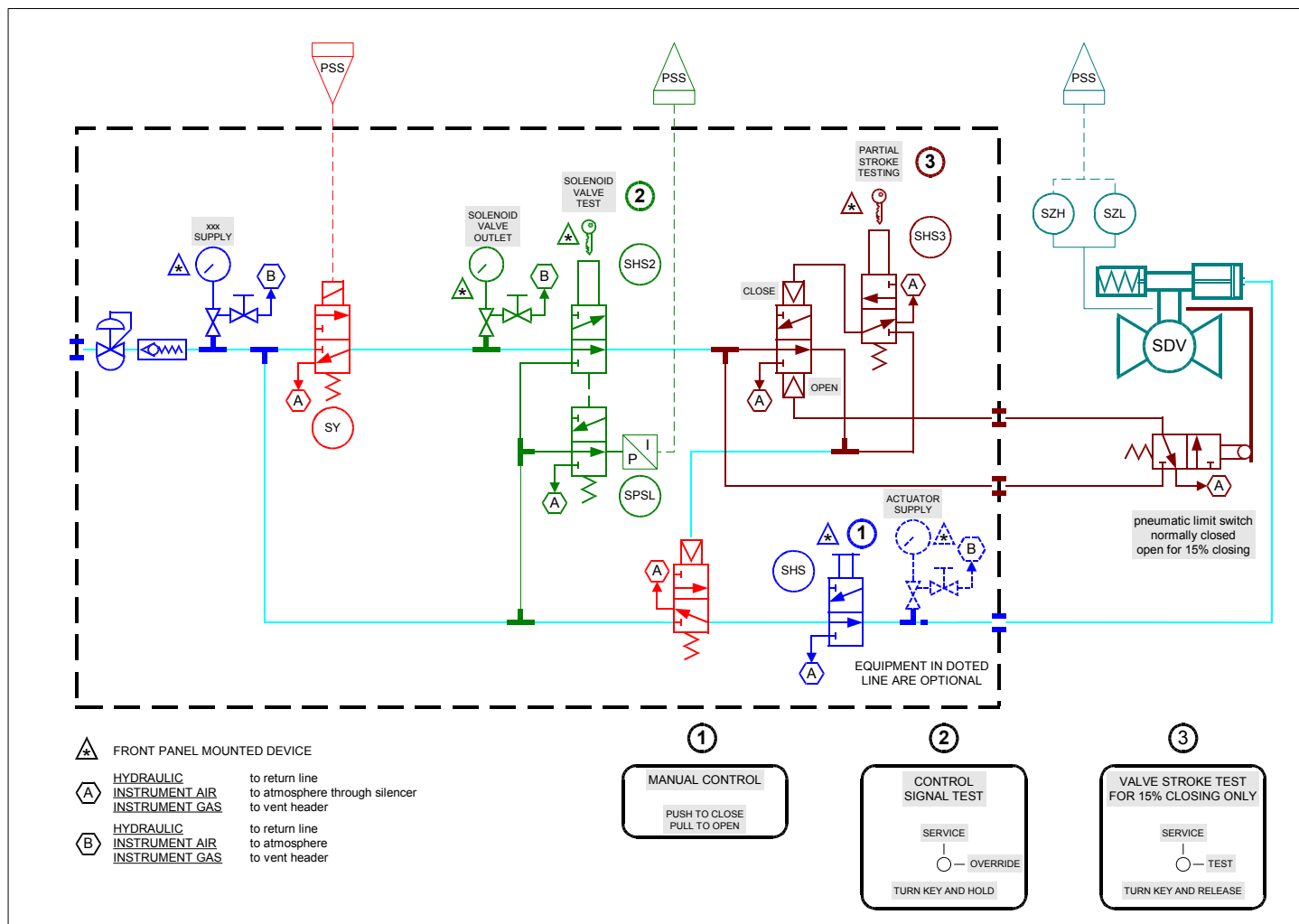


TYPICAL 204:

SDV – SINGLE ACTING

+ SOLENOID VALVE TEST

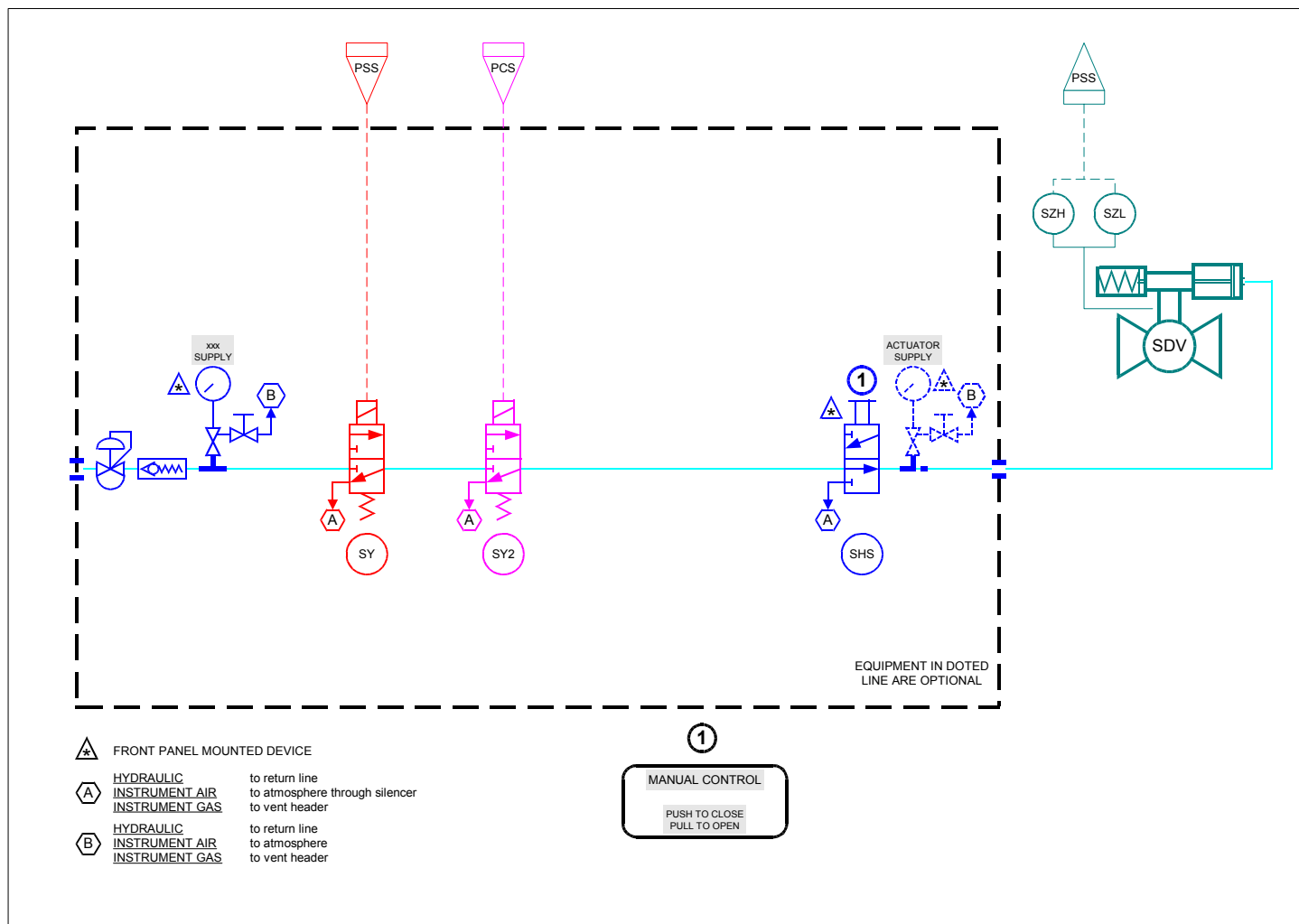
+ PARTIAL STROKE TESTING



TYPICAL 205:

SDV – SINGLE ACTING

+ PCS/UCP CONTROL



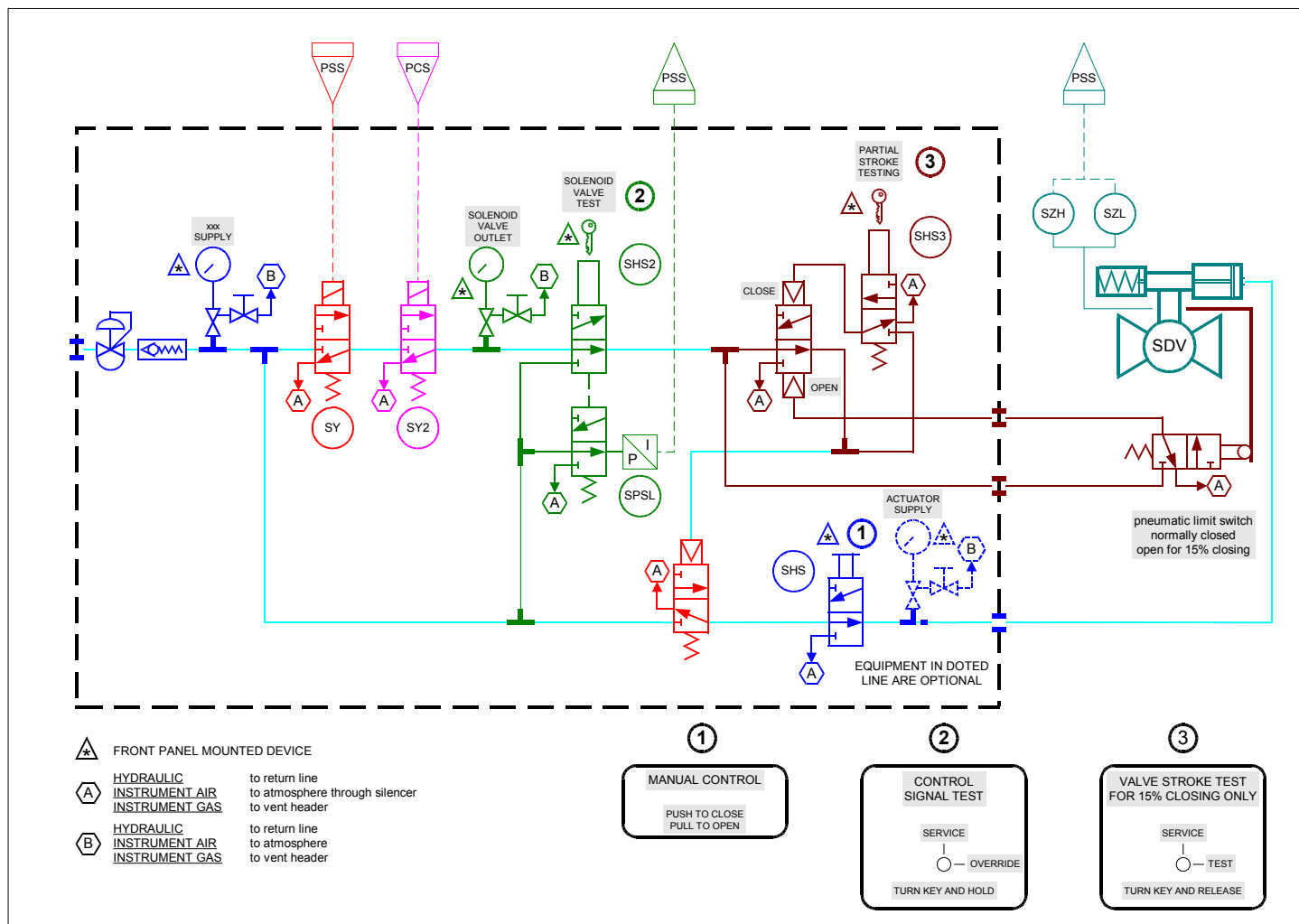
TYPICAL 206:

SDV – SINGLE ACTING

+ SOLENOID VALVE TEST

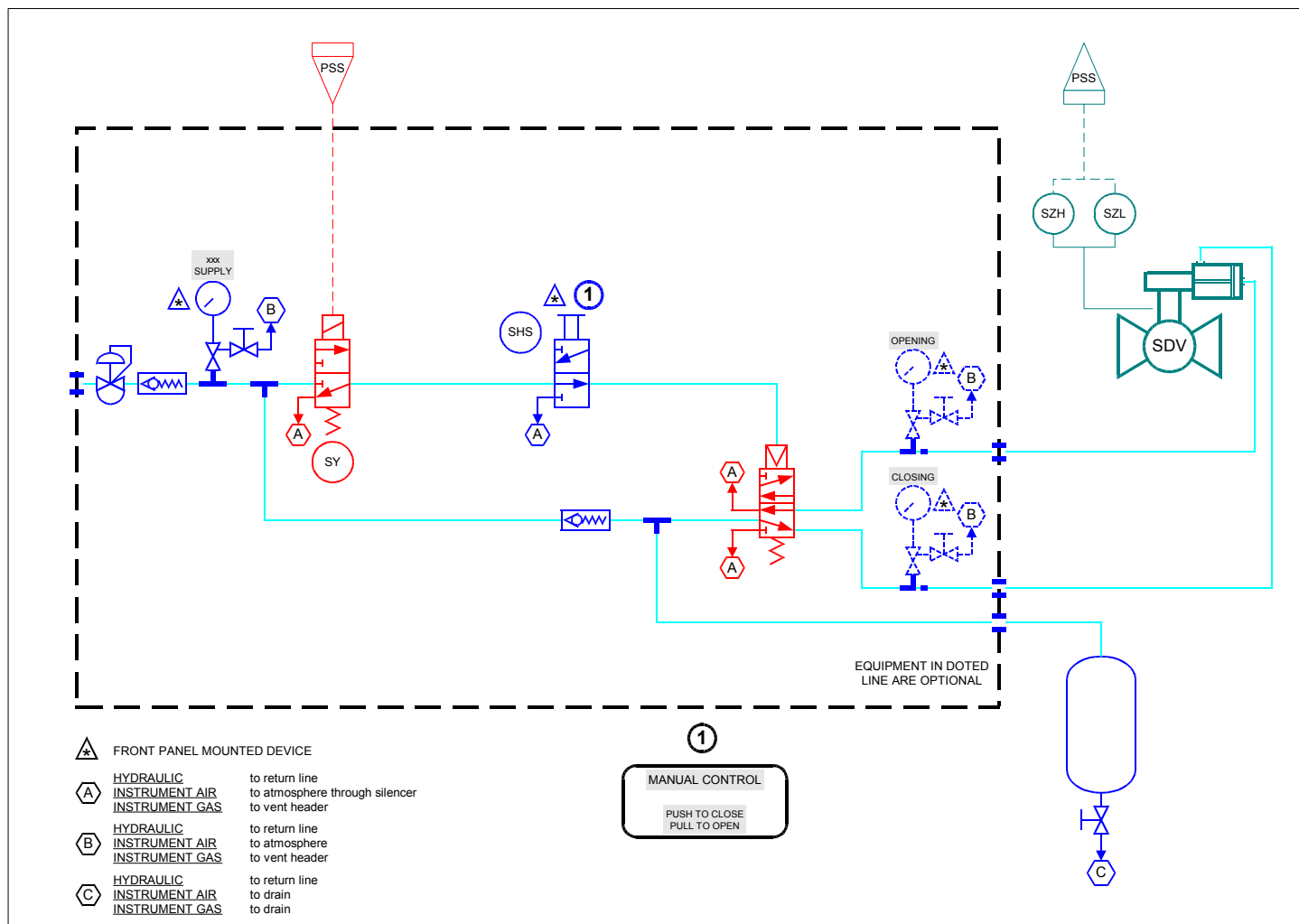
+ PARTIAL STROKE TESTING

+ PCS/UCP CONTROL



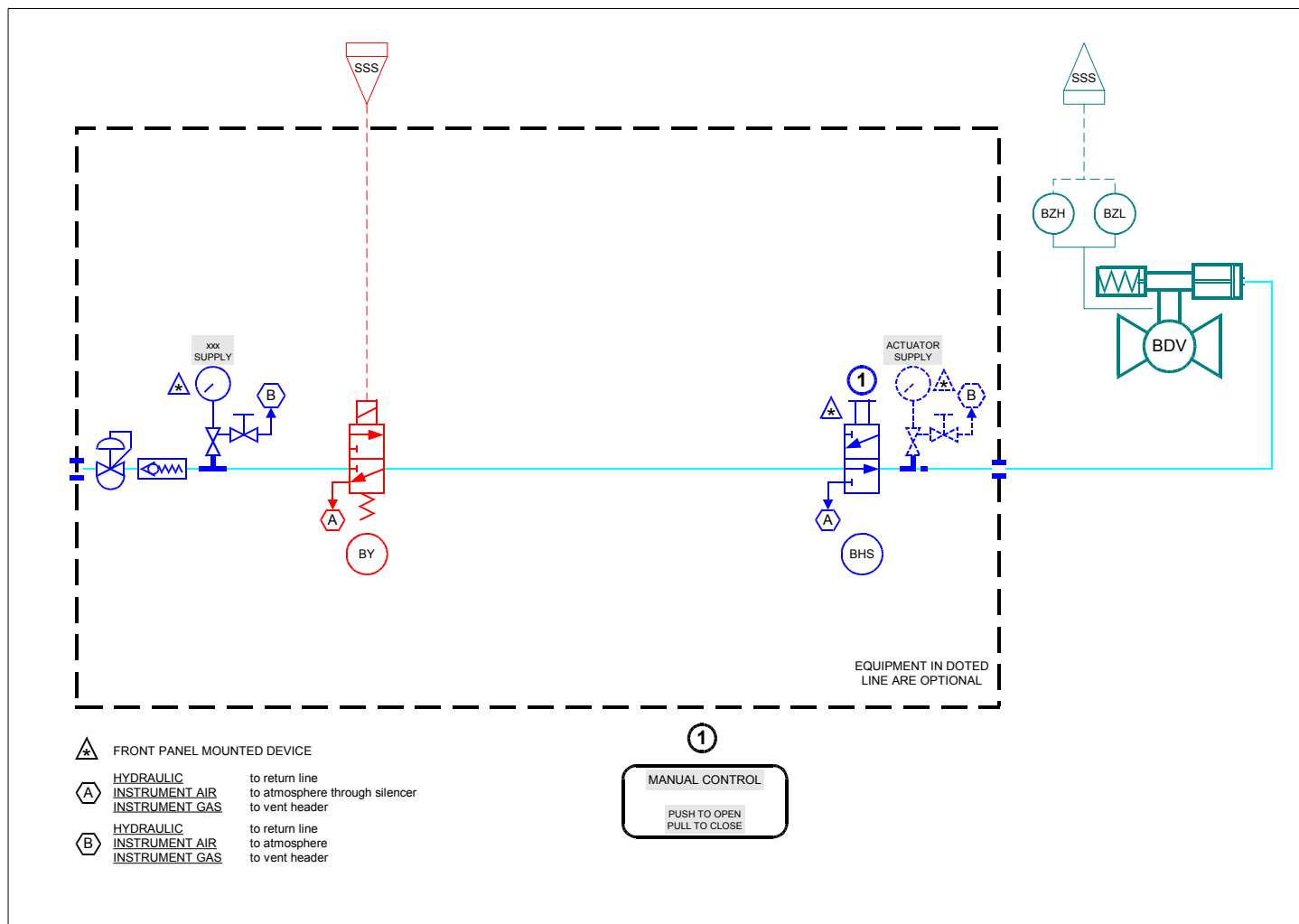
TYPICAL 251:

SDV – DOUBLE ACTING



TYPICAL 301:

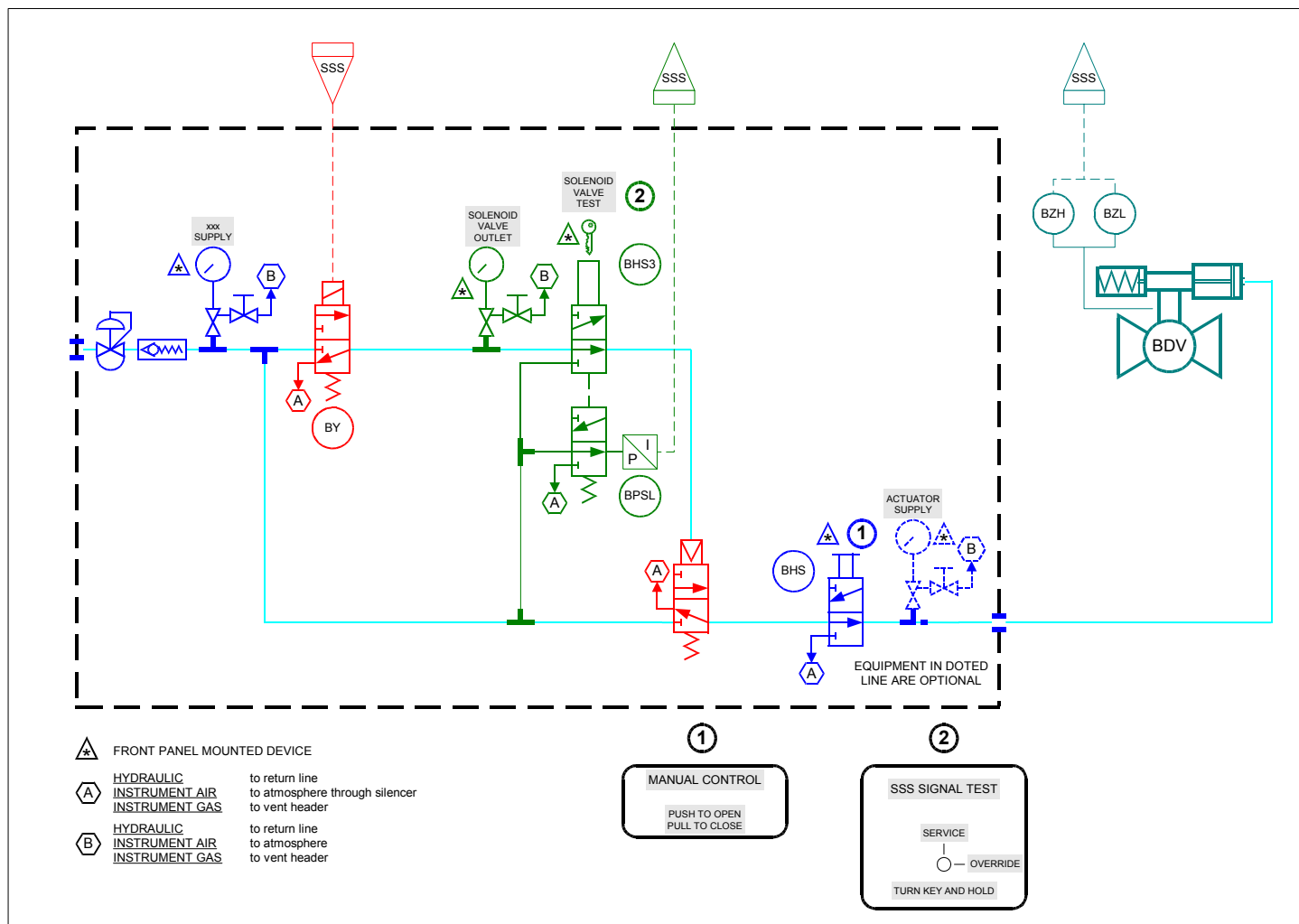
BDV – SINGLE ACTING



TYPICAL 302:

BDV – SINGLE ACTING

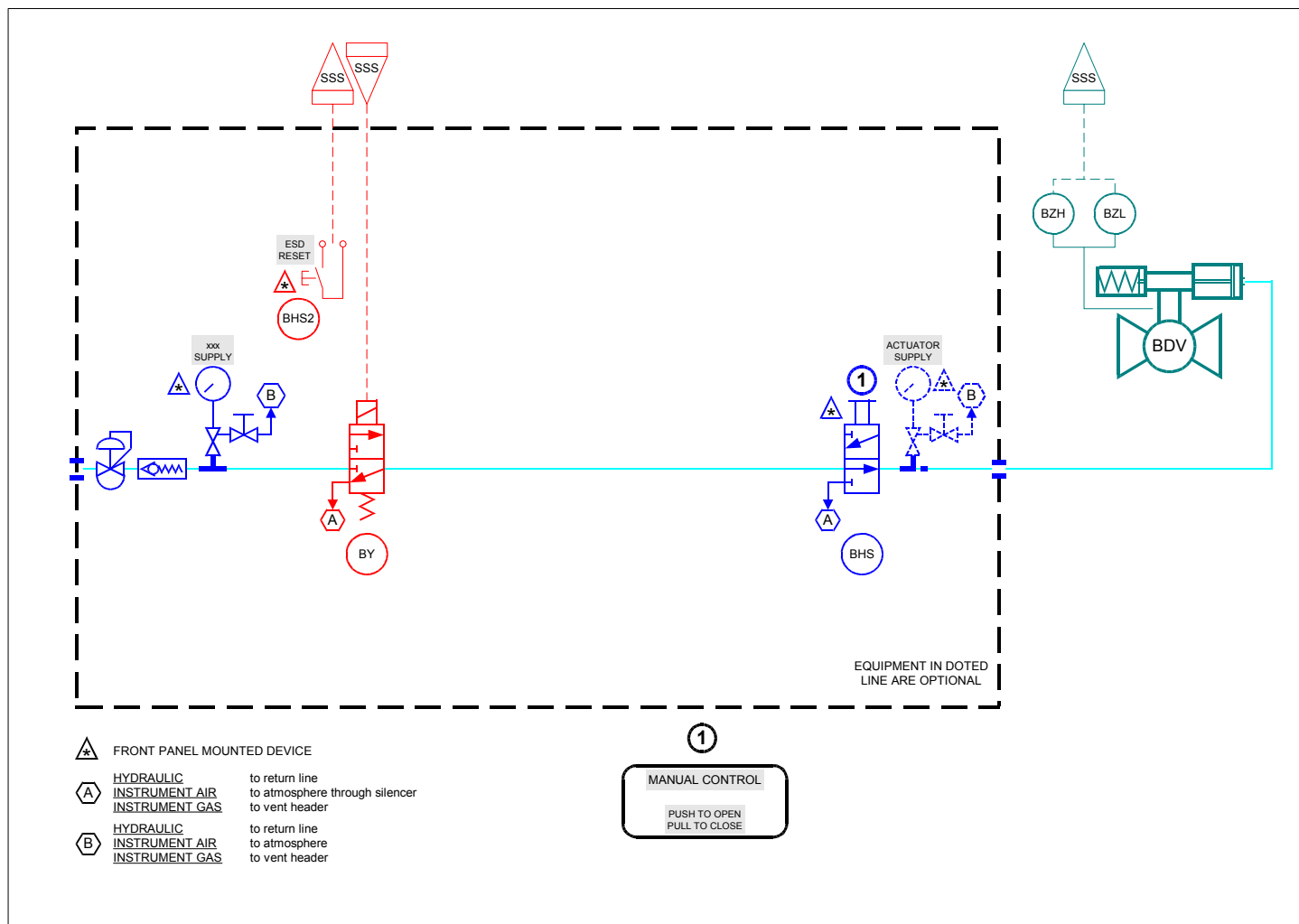
+ SOLENOID VALVE TEST



TYPICAL 311:

BDV – SINGLE ACTING

+ LOCAL RESET

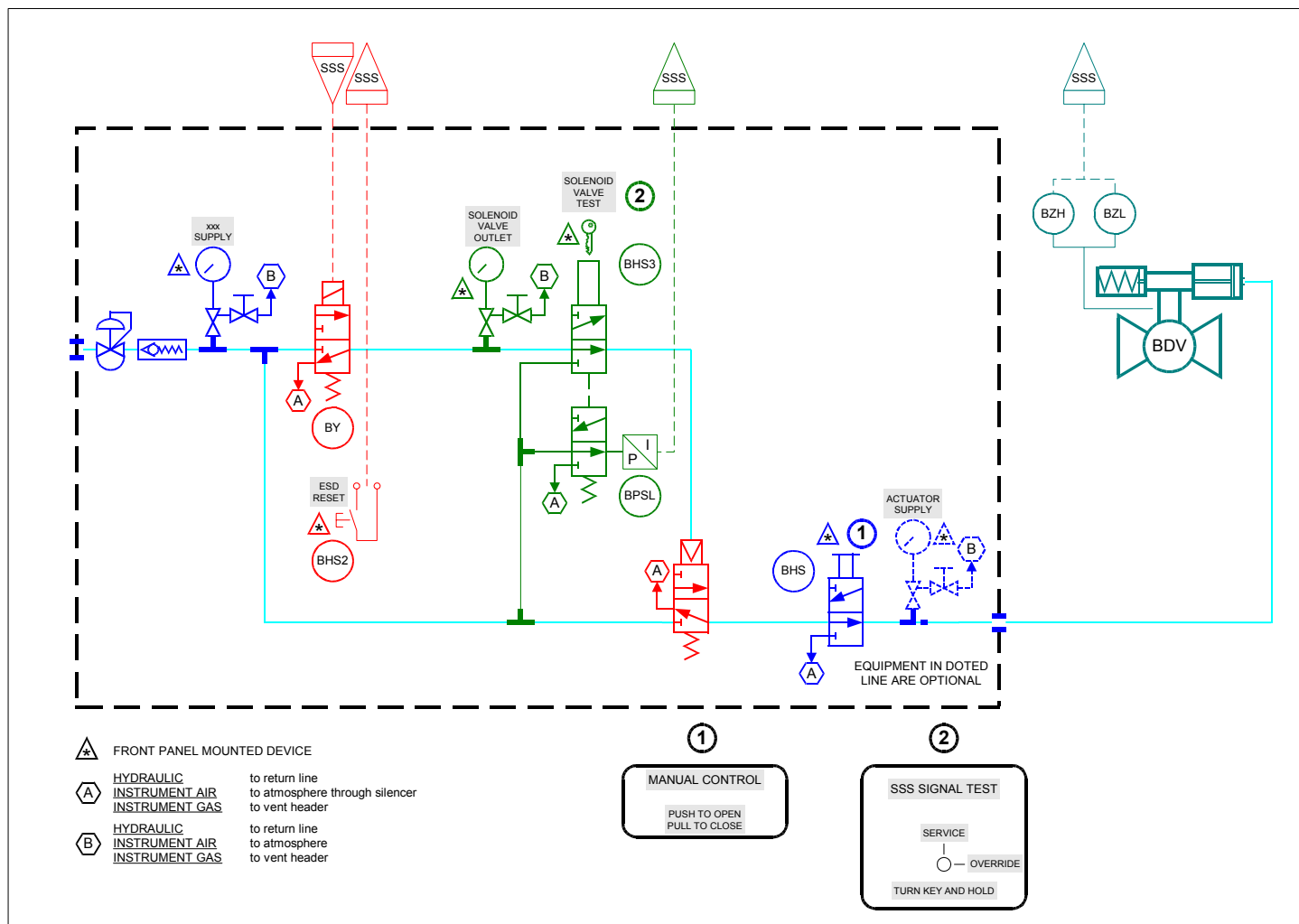


TYPICAL 312:

BDV – SINGLE ACTING

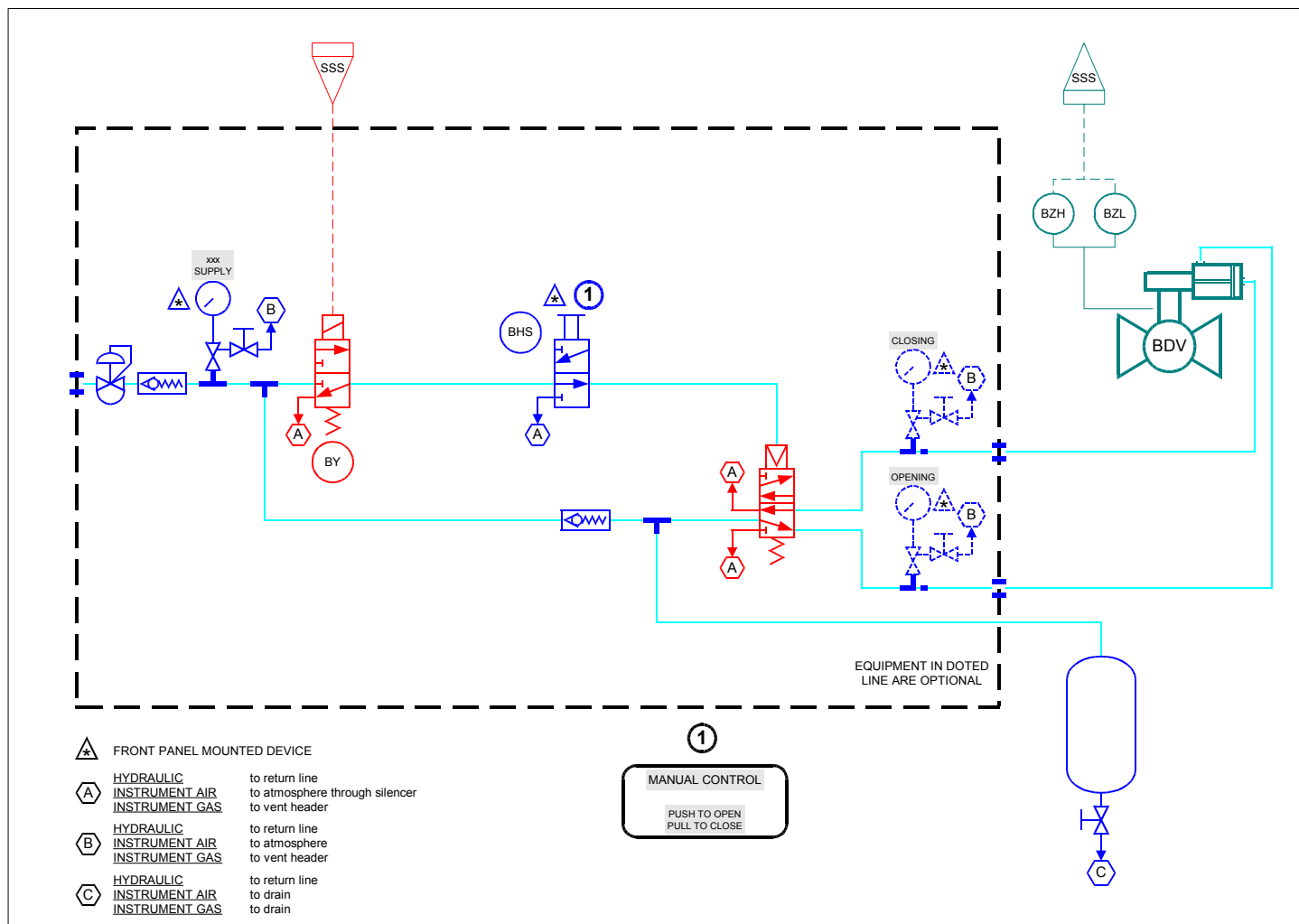
+ LOCAL RESET

+ SOLENOID VALVE TEST



TYPICAL 351:

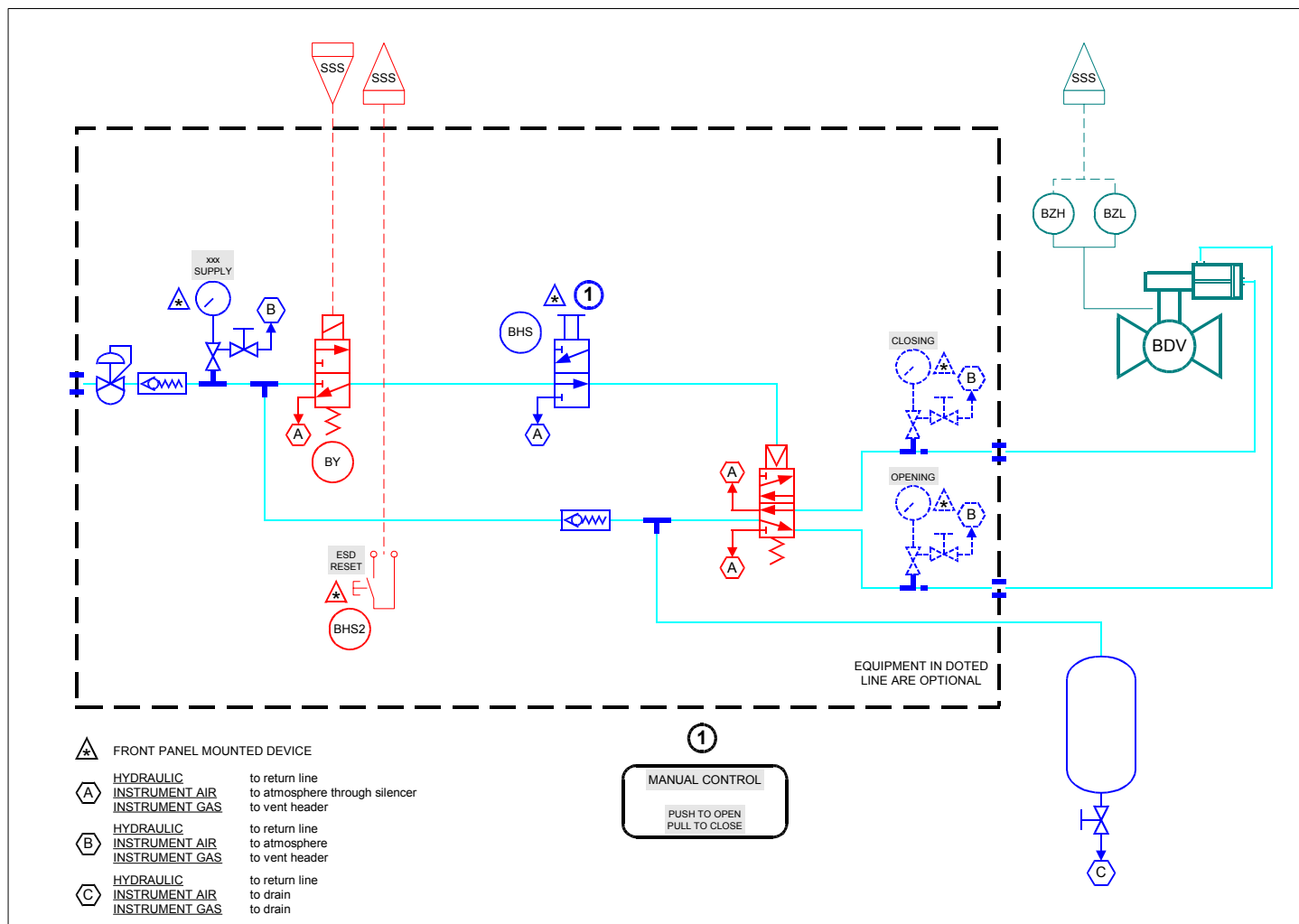
BDV – DOUBLE ACTING



TYPICAL 352:

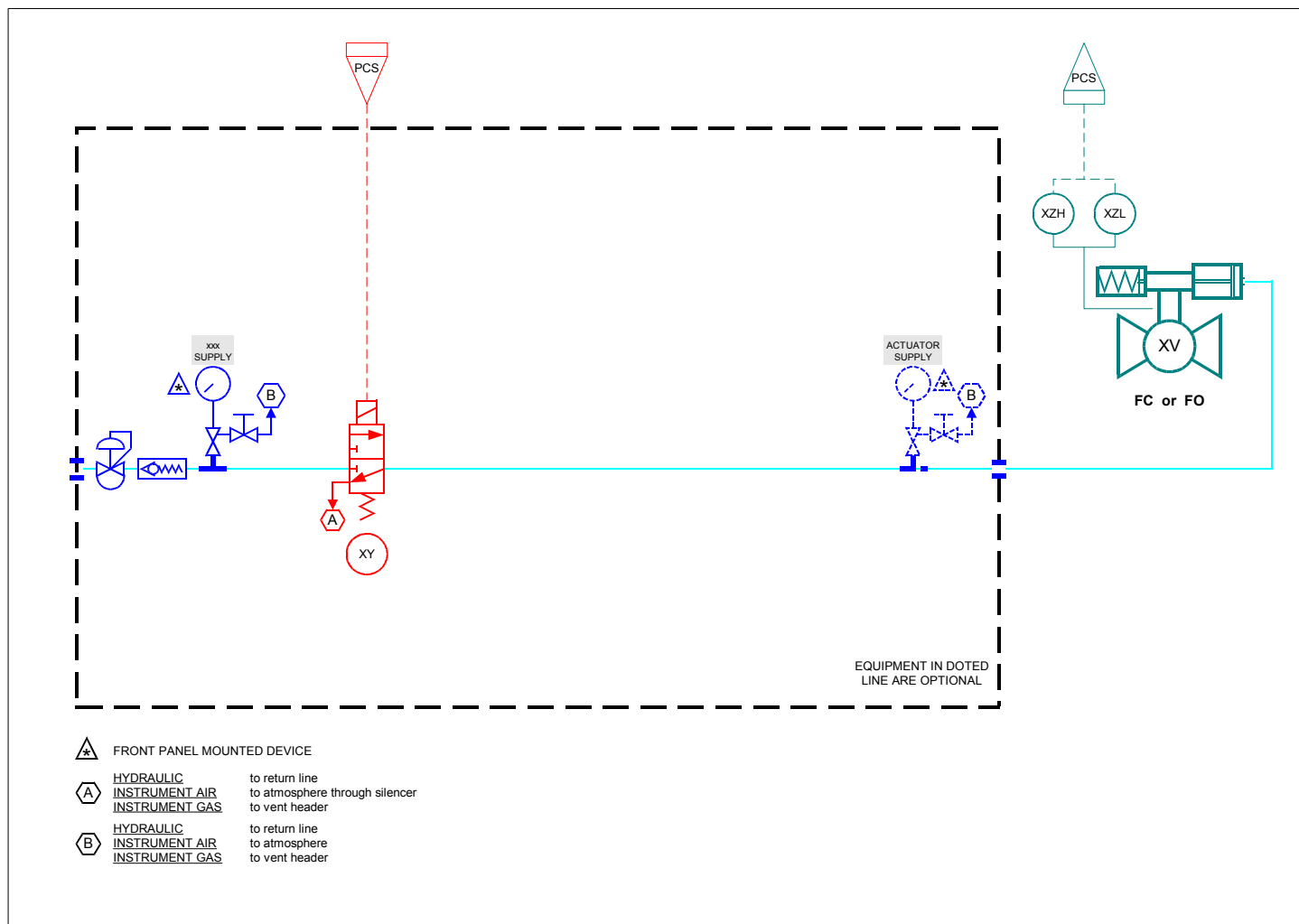
BDV – DOUBLE ACTING

+ LOCAL RESET



TYPICAL 401:

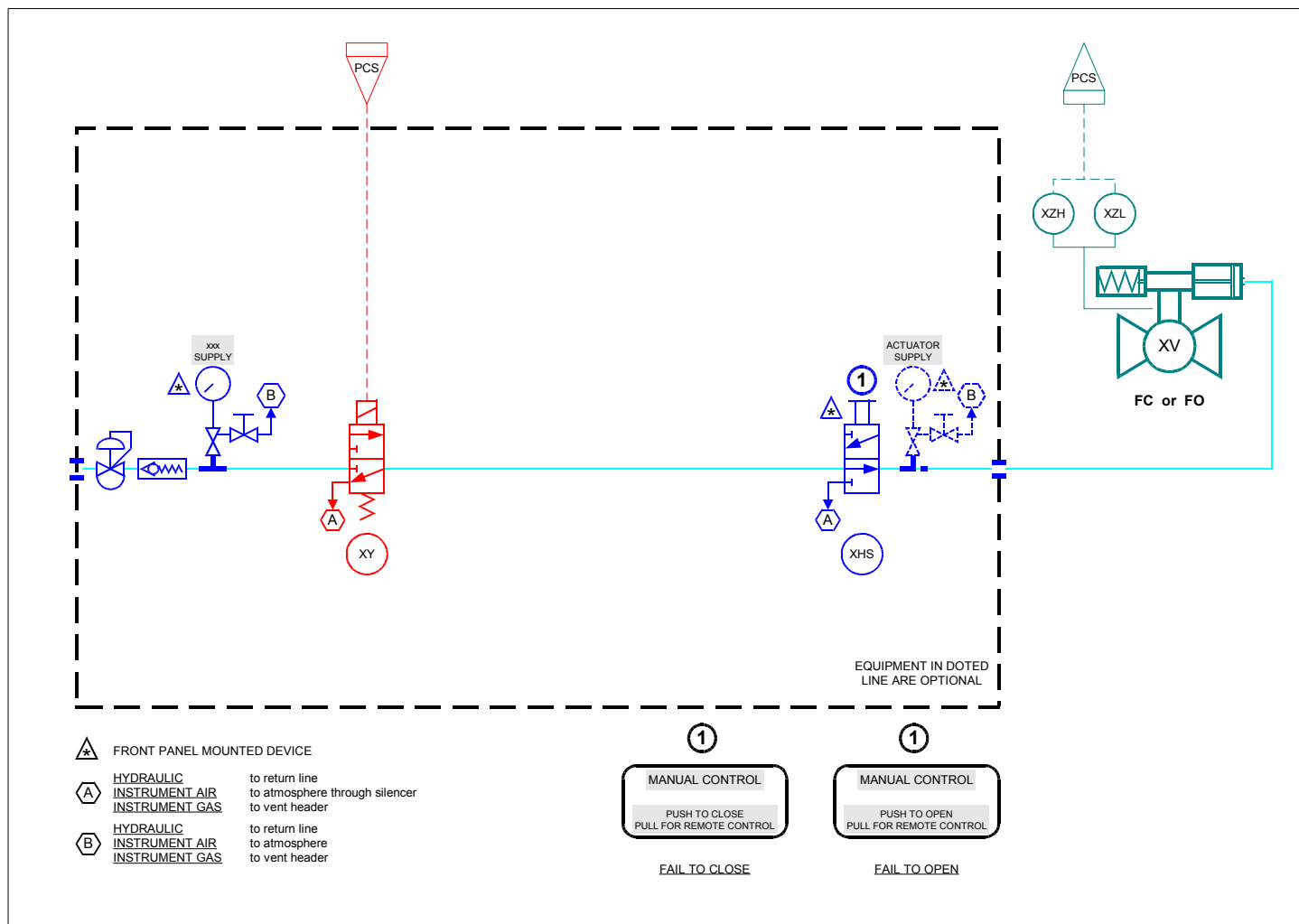
XV – SINGLE ACTING



TYPICAL 402:

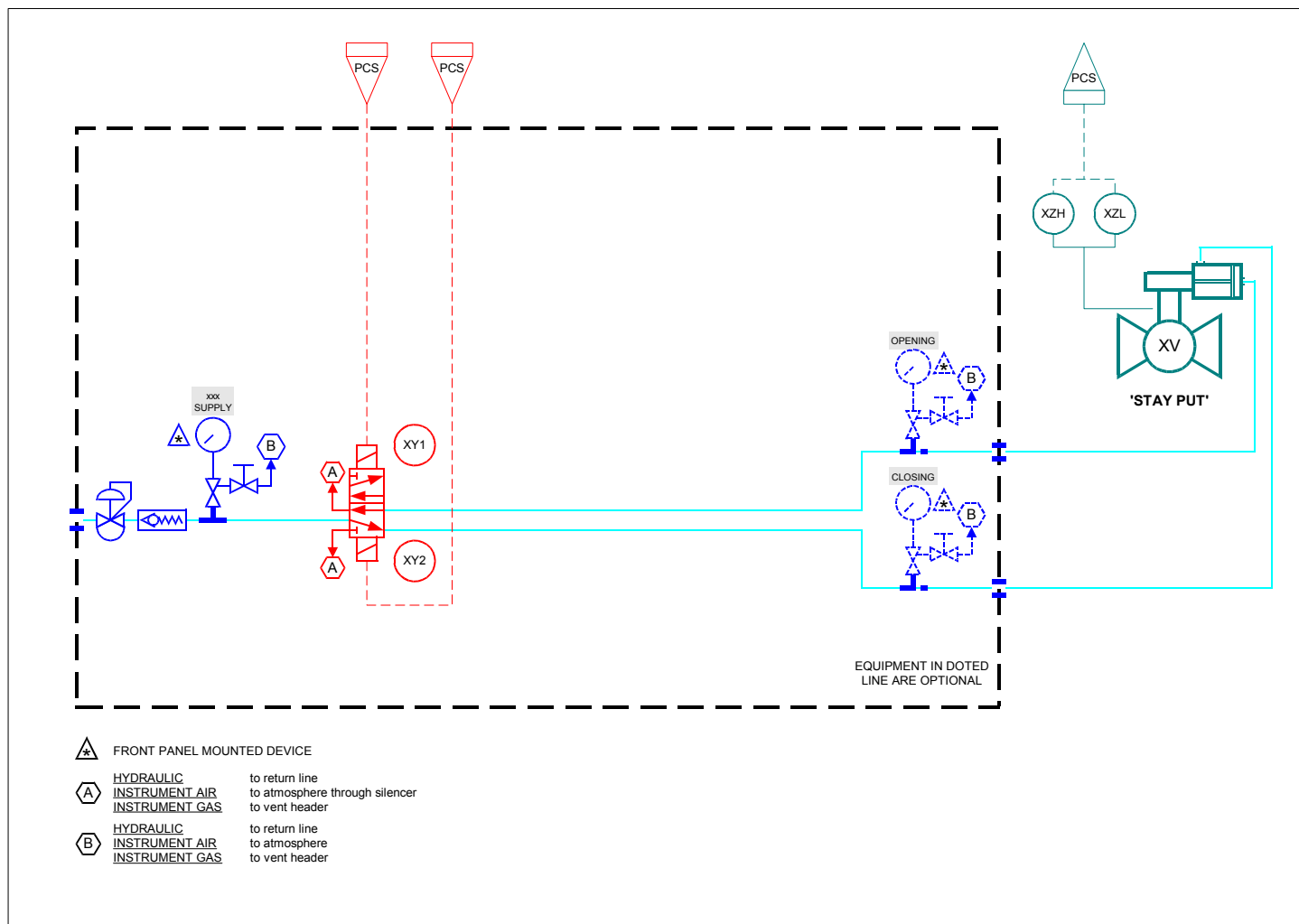
XV – SINGLE ACTING

+ LOCAL CONTROL



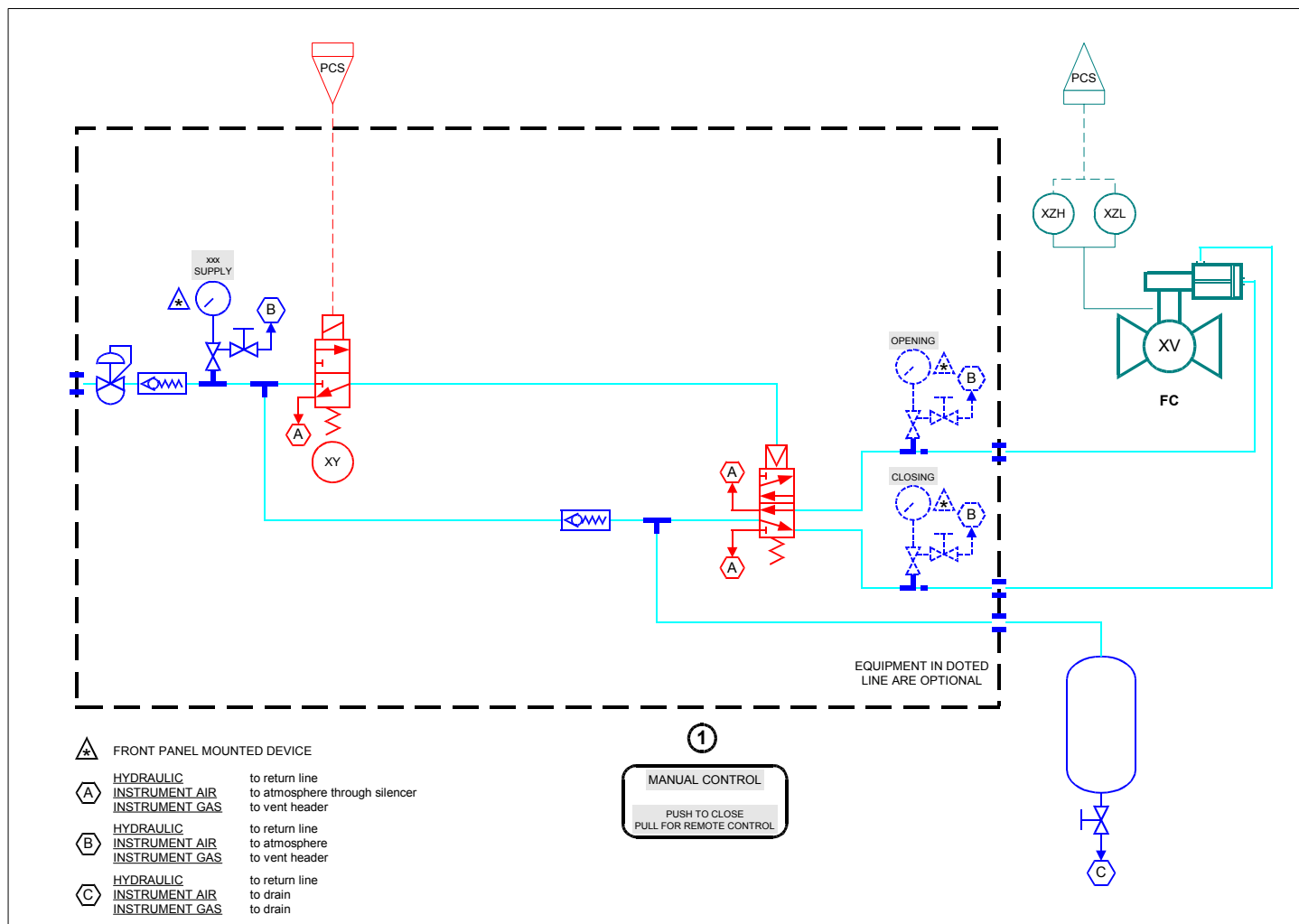
TYPICAL 451:

XV – DOUBLE ACTING - 'STAY PUT'



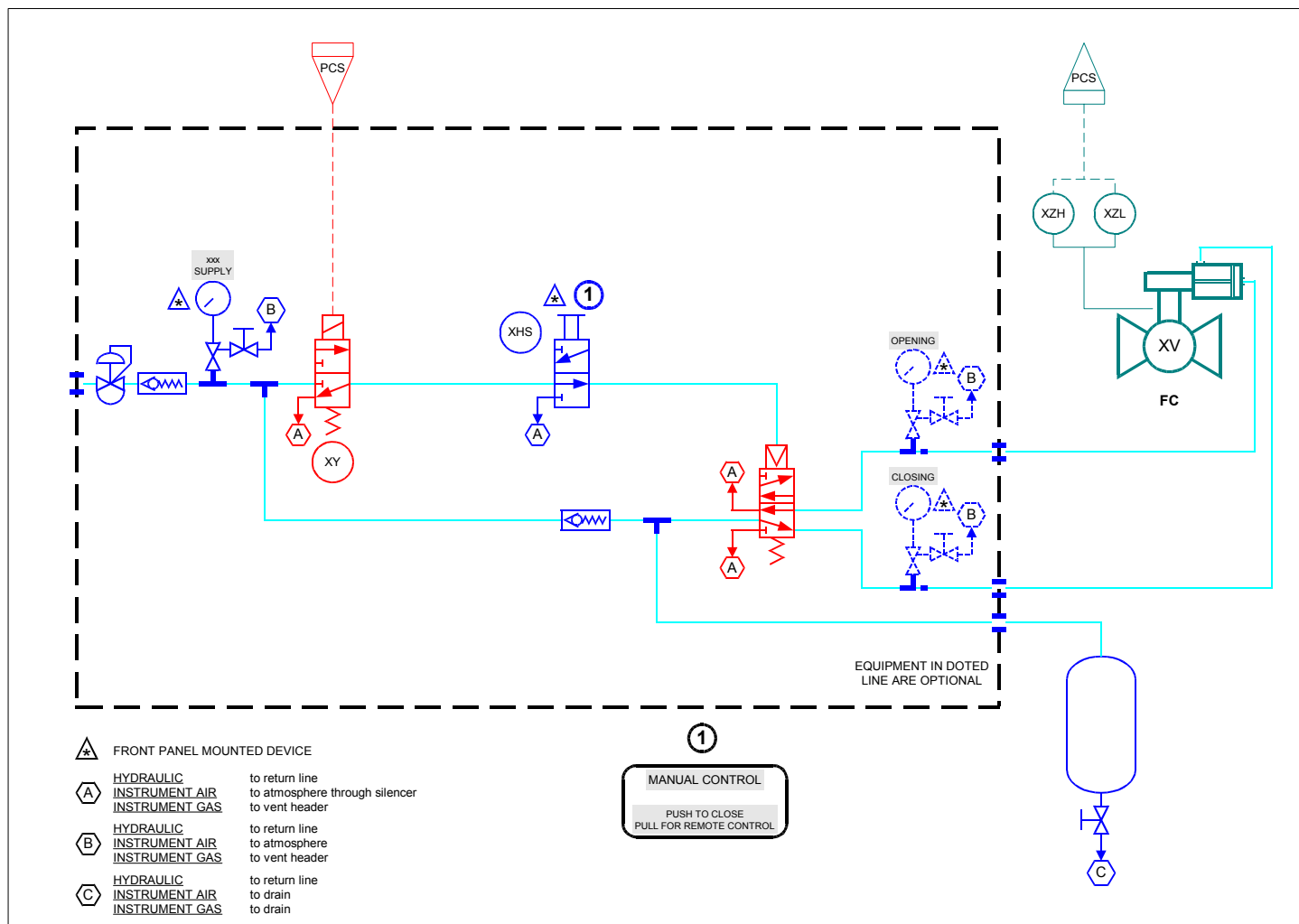
TYPICAL 452:

XV – DOUBLE ACTING - 'FAIL TO CLOSE'



TYPICAL 453:

XV – DOUBLE ACTING - ‘FAIL TO CLOSE’ + LOCAL CONTROL





Appendix 2 Valve / Actuator Functional Tests

VALVE / ACTUATOR FUNCTIONAL TESTS CHECK LIST

Project reference :

TAG N° _____

Actuator

N° _____

Valve

N° _____

Reference documents:

Valve data sheet	Doc./Rev	
General assembly drawing	Doc./Rev	
Schematic Diagram	Doc./Rev	Type
Torque table	Doc./Rev	

1. Conformity checking (prior to step 4.)

Checks to be performed		Check Results			Date
- Actuator Type - Control cabinet Type		Ok ☐	No ☐	NA ☐	
		Ok ☐	No ☐	NA ☐	
ACTUATOR END STOPS CHECKING (alignment between valve & actuator)	Open ☐ No ☐	Close ☐ No ☐			
Labeling (to be in accordance with General & project specification)		Ok ☐	No ☐	NA ☐	
Trafolyte labels on front door-----		Ok ☐	No ☐	NA ☐	
Trafolyte labels on inlet & outlet connections -----		Ok ☐	No ☐	NA ☐	
Trafolyte labels on components -----		Ok ☐	No ☐	NA ☐	
Trafolyte labels on limit switches box -----		Ok ☐	No ☐	NA ☐	
Stainless steel name plate on instruments -----		Ok ☐	No ☐	NA ☐	
Stainless steel name plate on actuator -----		Ok ☐	No ☐	NA ☐	
- Control cabinet components Type / reference - Control cabinet & components Material - Control cabinet components & connections diameter - ATEX certified elect. components & cable glands - Breathing of panel - Grounding of instruments inside the panel - Grounding facility of panel - Limit switches type (induction) - Actuator local indicator - Valve mechanical local indicator		Ok ☐	No ☐	NA ☐	
		Ok ☐	No ☐	NA ☐	
		Ok ☐	No ☐	NA ☐	
		Ok ☐	No ☐	NA ☐	
		Ok ☐	No ☐	NA ☐	
		Ok ☐	No ☐	NA ☐	
		Ok ☐	No ☐	NA ☐	
		Ok ☐	No ☐	NA ☐	
- Dimensional checking of actuator - Dimensional checking of cabinet		Ok ☐	No ☐	NA ☐	
		Ok ☐	No ☐	NA ☐	
- Painting (type, color, aspect, thickness) - Control cabinet - Actuator - Valve		Ok ☐	No ☐	NA ☐	
		Ok ☐	No ☐	NA ☐	
		Ok ☐	No ☐	NA ☐	
		Ok ☐	No ☐	NA ☐	

2. Verification of Torques Safety Factor (prior to perform 4.)

Measured Valve Break Away Torque value to Open		Measured Actuator Torque value to Open	
At max. differential pressure _____ bar		At minimum supply pressure=_____ barg	
At maximum supply pressure=_____ barg		At maximum supply pressure=_____ barg	
Side A Torque value(2)	_____ Nm	Actuat.Torq.value at Pmini(1) = _____ Nm	
Side B Torque value 2)	_____ Nm		
Maxi Shear Torque (3)	_____ Nm	Actuat.Torq.value at Pmaxi (4)=_____ Nm	
SAFETY FACTOR = (1) / (2) >or = 1,3			
Maxi Allowable Valve Torque checking(4)< (3)		Ok ☐ - No ☐ -	

3. Other verifications to be performed before functional tests

- Actuator Power Supply----- - Operating pressure or voltage----- - Pilot Supply ----- - Pilot pressure or voltage -----	Pneumatic / hydraulic / electric _____ barg / _____ volt Pneumatic / hydraulic / electric _____ barg / _____ volt
- Supply flexibles I.D. suitable for contr.panel connections - Supply flexibles inlet/outlet correctly connected - Air drained (for hydraulic supply) - Tubing and connections tightness	Ok ☐ - NA ☐ Ok ☐ - NA ☐ Ok ☐ - NA ☐ Ok ☐ - NA ☐

4.Functional tests

4.1 Operating time

Parameters	Required values	Results obtained		Remarks	
		Side A	Side B		
Valve Diff.pressure	_____ bar	_____ bar	_____ bar		
Minimum.actuator oil / air supply pressure	_____ barg	_____ barg	_____ barg		
▪ Closing time	_____ sec	_____ sec	_____ sec		Ok ☐ -
▪ Opening time	_____ sec	_____ sec	_____ sec		Ok ☐ -
Maximum.actuator oil /air supply pressure	_____ barg	_____ barg	_____ barg		
▪ Closing time	_____ sec	_____ sec	_____ sec		Ok ☐ -
▪ Opening time	_____ sec	_____ sec	_____ sec		Ok ☐ -

4.2 Safety Accumulator capacity (hydraulic type)

Minimum strokes number with accumulator:		
▪ with maxi supply pressure (_____ barg) Qty stroke req = _____ Qty obt. _____		Ok ☐ -
▪ with nominal supply pressure (_____ barg) Qty stroke req = _____ Qty obt. _____		Ok ☐ -

4.3 Solenoid Valve + manual override tests

TEST CONDITIONS (BDV = C other = O)	TEST RESULTS	
1. Solenoid.valve : "normal" position (energised)	→solenoid valve test gauge to pressure supply	Ok ☐ -
2. turn the override key in test position	→valve stay in position press.switch ON » →	Ok ☐ -
3. switch OFF the solenoid	solenoid valve test gauge to « 0 »	Ok ☐ -
4. switch ON the solenoid	→ solenoid valve test gauge to press.sup."	Ok ☐ -
5. turn the override key in service position	→ pressure switch « OFF »	Ok ☐ -
▪ The valve stays on position all along the tests		Ok ☐ -



4.4 Inching test (Partial stroking function)				
TEST CONDITIONS		TEST RESULTS		Ok ☐ -
▪ Valve in normal operating position ▪ Turn and release the inching test key		▪ Valve moves 15° to the safety position and returns to normal operating position		
4.5 Open / close command tests				
TEST CONDITIONS		TEST RESULTS		Ok ☐ NA ☐
1. Solenoid valve not energised 2. Manual command on test position 3. Remote command ON / OFF 4. Manual command on service position 5. Remote command ON / OFF - Limit switches O/C 6. Emergency command action		→ BDV = O & ESDV-PSDV-XV-LV = C → BDV = C & ESDV-PSDV-XV-LV = O → Command inhibited → BDV = O & ESDV-PSDV-XV-LV = C → Ball Valve O/C or C/O → Visual position indicator Open / Close → BDV = O & ESDV-PSDV-XV-LV = C		
4.6 Timer test (for BDV)				
Hydraulic Accumulator precharged value :		Req = barg	Adjusted = barg	Ok ☐
Required time before opening action		_____ Sec	Set time _____ Sec	Ok ☐
Timer sensitivity: remaining turns before needle valve is fully closed			_____ turns	Ok ☐
4.7 Pressure Safety Valve test				
PSV Maxi setting pressure (see torque table):		Req	barg checked	barg Ok ☐
4.8 MOV Additional tests				
1) Closing stop on		Limit switch ☐	Opening stop on Limit switch ☐	
		Torque limiter ☐	Torque limiter ☐	
2) Actuator Mechanical End stops setting (Open/Close)			Ok ☐ -	No ☐ - NA ☐ -
3) Actuator Electrical End stops setting (Open/Close)			Ok ☐ -	No ☐ - NA ☐ -
4) Required Set Torque	Open Close	Required _____ % Required _____ %	set _____ % set _____ %	Break to O Torque _____ Nm* Break to C Torque _____ Nm* *see test certificates
Command (local/remote)		Ok ☐ - No ☐ - NA ☐ -	Valve differential pressure	
Command (manual)		Ok ☐ - No ☐ - NA ☐ -	bar	
Remarks				
Final acceptance		ACCEPTED ☐		REJECTED ☐
MANUFACTURER	INSPECTION Rep		THIRD PART INSP.	COMPANY Rep
Date :	Date :		Date :	Date :
Name :	Name :		Name :	Name :
Signature :	Signature :		Signature :	Signature :