

PURCHASER



**NUCLEAR POWER CORPORATION OF INDIA LTD. (NPCIL)**  
(A GOVERNMENT OF INDIA ENTERPRISE)

PROJECT

**2x700 MW RAJASTHAN ATOMIC POWER PROJECT (UNIT 7&8)**  
**KOTA, RAJASTHAN, INDIA**

CONTRACTOR



**ISOLATING VALVES SPECIFICATION  
FOR RETURN AND SAFETY CIRCUIT  
(HP&LP VALVES SERVOMOTORS)**

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# ISOLATING VALVES SPECIFICATION

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# 1 General

## 1.1 Responsibility

The supplier is fully responsible for compliance with all requirements in this specification.

Purchaser approval of the application of the equipment does not relieve the supplier's responsibility in any way.

## 1.2 Definitions

- |    |              |   |
|----|--------------|---|
| 1) | Project      | Nuclear project localized in Asia: 2x700 MW Rawatbhata Atomic Power Project (unit 7&8) Dist. Kota, Rajasthan, India |
| 2) | Purchaser    | Responsible for the turbine hall project  |
| 3) | Supplier     | Responsible for the Isolating Valves  |
| 4) | HP&LP valves | High and Low Pressure steam Valves  |
| 5) | HP SV        | High Pressure steam Stop Valve  |
| 6) | HP CV        | High Pressure steam Control Valve   |
| 7) | LP SV        | Low Pressure steam Stop Valve   |
| 8) | LP CV        | Low Pressure steam Control Valve  |

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## 1.3 Foreseen application and purpose

This specification covers the mandatory technical requirements and necessary data, for the design and supply of Isolating Valves installed on the Safety Fluid circuit and Returns Fluid circuit for HP&LP Valves Servomotors. These HP&LP Valves Servomotors will be used for Rawatbhata project.

The fluid used in operation is a fire resistant fluid (Phosphate Ester based). Refer to Flame-Resistant-Hydraulic Fluids [7]

## 1.4 Categories and criticality

The Isolating Valves are not Nuclear Safety related but critical for the turbine operation during start-up and shutdown sequences.

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## 1.5 Scope of supply

The supply includes the following elements:

### 1.5.1 Scope

- The following components.

	Component	Qty	Item
HP Steam Actuator CV 6001	Safety circuit Isolating Block, with: -Isolating lockable Valve -Isolating lockable Valve -Discharge lockable Valve	1 1 1 1	4111-HYD-6101 4111-HYD-6101 (A) 4111-HYD-6101 (B) 4111-HYD-6101 (C)
	Return circuit Isolating Valve	1	4136-V-6034
HP Steam Actuator V 6001	Safety circuit Isolating Block, with: -Isolating lockable Valve -Isolating lockable Valve -Discharge lockable Valve	1 1 1 1	4111-HYD-6111 4111-HYD-6111 (A) 4111-HYD-6111 (B) 4111-HYD-6111 (C)
	Return circuit Isolating Valve	1	4136-V-6035
HP Steam Actuator CV 6002	Safety circuit Isolating Block, with: -Isolating lockable Valve -Isolating lockable Valve -Discharge lockable Valve	1 1 1 1	4111-HYD-6102 4111-HYD-6102 (A) 4111-HYD-6102 (B) 4111-HYD-6102 (C)
	Return circuit Isolating Valve	1	4136-V-6042
HP Steam Actuator V 6002	Safety circuit Isolating Block, with: -Isolating lockable Valve -Isolating lockable Valve -Discharge lockable Valve	1 1 1 1	4111-HYD-6112 4111-HYD-6112 (A) 4111-HYD-6112 (B) 4111-HYD-6112 (C)
	Return circuit Isolating Valve	1	4136-V-6044

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	Component	Qty	Item
HP Steam Actuator CV 6003	Safety circuit Isolating Block, with: -Isolating lockable Valve -Isolating lockable Valve -Discharge lockable Valve	1 1 1 1	4111-HYD-6103 4111-HYD-6103 (A) 4111-HYD-6103 (B) 4111-HYD-6103 (C)
	Return circuit Isolating Valve	1	4136-V-6033
HP Steam Actuator V 6003	Safety circuit Isolating Block, with: -Isolating lockable Valve -Isolating lockable Valve -Discharge lockable Valve	1 1 1 1	4111-HYD-6113 4111-HYD-6113 (A) 4111-HYD-6113 (B) 4111-HYD-6113 (C)
	Return circuit Isolating Valve	1	4136-V-6036
HP Steam Actuator CV 6004	Safety circuit Isolating Block, with: -Isolating lockable Valve -Isolating lockable Valve -Discharge lockable Valve	1 1 1 1	4111-HYD-6104 4111-HYD-6104 (A) 4111-HYD-6104 (B) 4111-HYD-6104 (C)
	Return circuit Isolating Valve	1	4136-V-6043
HP Steam Actuator V 6004	Safety circuit Isolating Block, with: -Isolating lockable Valve -Isolating lockable Valve -Discharge lockable Valve	1 1 1 1	4111-HYD-6114 4111-HYD-6114 (A) 4111-HYD-6114 (B) 4111-HYD-6114 (C)
	Return circuit Isolating Valve	1	4136-V-6045
LP Steam Actuator CV 6005	Safety circuit Isolating Block, with: -Isolating lockable Valve -Isolating lockable Valve -Discharge lockable Valve	1 1 1 1	4111-HYD-6105 4111-HYD-6105 (A) 4111-HYD-6105 (B) 4111-HYD-6105 (C)
	Return circuit Isolating Valve	1	4136-V-6037
LP Steam Actuator V 6005	Safety circuit Isolating Block, with: -Isolating lockable Valve -Isolating lockable Valve -Discharge lockable Valve	1 1 1 1	4111-HYD-6115 4111-HYD-6115 (A) 4111-HYD-6115 (B) 4111-HYD-6115 (C)
	Return circuit Isolating Valve	1	4136-V-6055

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	Component	Qty	Item
LP Steam Actuator CV 6006	Safety circuit Isolating Block, with: -Isolating lockable Valve -Isolating lockable Valve -Discharge lockable Valve	1 1 1 1	4111-HYD-6106 4111-HYD-6106 (A) 4111-HYD-6106 (B) 4111-HYD-6106 (C)
	Return circuit Isolating Valve	1	4136-V-6039
LP Steam Actuator V 6006	Safety circuit Isolating Block, with: -Isolating lockable Valve -Isolating lockable Valve -Discharge lockable Valve	1 1 1 1	4111-HYD-6116 4111-HYD-6116 (A) 4111-HYD-6116 (B) 4111-HYD-6116 (C)
	Return circuit Isolating Valve	1	4136-V-6058
LP Steam Actuator CV 6007	Safety circuit Isolating Block, with: -Isolating lockable Valve -Isolating lockable Valve -Discharge lockable Valve	1 1 1 1	4111-HYD-6107 4111-HYD-6107 (A) 4111-HYD-6107 (B) 4111-HYD-6107 (C)
	Return circuit Isolating Valve	1	4136-V-6038
LP Steam Actuator V 6007	Safety circuit Isolating Block, with: -Isolating lockable Valve -Isolating lockable Valve -Discharge lockable Valve	1 1 1 1	4111-HYD-6117 4111-HYD-6117 (A) 4111-HYD-6117 (B) 4111-HYD-6117 (C)
	Return circuit Isolating Valve	1	4136-V-6056
LP Steam Actuator CV 6008	Safety circuit Isolating Block, with: -Isolating lockable Valve -Isolating lockable Valve -Discharge lockable Valve	1 1 1 1	4111-HYD-6108 4111-HYD-6108 (A) 4111-HYD-6108 (B) 4111-HYD-6108 (C)
	Return circuit Isolating Valve	1	4136-V-6040
LP Steam Actuator V 6008	Safety circuit Isolating Block, with: -Isolating lockable Valve -Isolating lockable Valve -Discharge lockable Valve	1 1 1 1	4111-HYD-6118 4111-HYD-6118 (A) 4111-HYD-6118 (B) 4111-HYD-6118 (C)
	Return circuit Isolating Valve	1	4136-V-6059

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	Component	Qty	Item
LP Steam Actuator CV 6009	Safety circuit Isolating Block, with: -Isolating lockable Valve -Isolating lockable Valve -Discharge lockable Valve	1 1 1 1	4111-HYD-6109 4111-HYD-6109 (A) 4111-HYD-6109 (B) 4111-HYD-6109 (C)
	Return circuit Isolating Valve	1	4136-V-6032
LP Steam Actuator V 6009	Safety circuit Isolating Block, with: -Isolating lockable Valve -Isolating lockable Valve -Discharge lockable Valve	1 1 1 1	4111-HYD-6119 4111-HYD-6119 (A) 4111-HYD-6119 (B) 4111-HYD-6119 (C)
	Return circuit Isolating Valve	1	4136-V-6057
LP Steam Actuator CV 6010	Safety circuit Isolating Block, with: -Isolating lockable Valve -Isolating lockable Valve -Discharge lockable Valve	1 1 1 1	4111-HYD-6110 4111-HYD-6110 (A) 4111-HYD-6110 (B) 4111-HYD-6110 (C)
	Return circuit Isolating Valve	1	4136-V-6041
LP Steam Actuator V 6010	Safety circuit Isolating Block, with: -Isolating lockable Valve -Isolating lockable Valve -Discharge lockable Valve	1 1 1 1	4111-HYD-6120 4111-HYD-6120 (A) 4111-HYD-6120 (B) 4111-HYD-6120 (C)
	Return circuit Isolating Valve	1	4136-V-6060

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- Isolating Valves
- Interconnecting fittings/blocks
- Counter Flange, for each SAE connection
- Design
- Manufacturing and assembly
- Handling devices (If necessary)
- Factory Inspections and tests.
- On-site test procedure.
- Commissioning and maintenance manuals.
- Special tools.
- Spare parts.
- Storage protection and packaging.

1.5.2 Terminal points

- Refer to data sheets in Appendices

1.5.3 Scope of work

- All necessary calculations, detail design, drawings, lists, etc.
- Workshop assembly,
- Cleaning.
- Marking, identification and labeling,
- Factory documentation (reports, etc),

1.5.4 Exclusions

- On site tests
- On site erection
- On site erection and commissioning (in scope of purchaser)

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## 2 Material properties requirements

Materials used shall be compatible with fire resistant fluid, refer to Flame-Resistant-Hydraulic Fluids [7].

### 2.1 Mechanical properties

#### 2.1.1 Metallic components

- All mechanical elements in contact with the fluid shall be stainless steel.
- Others metallic components shall have a protective coating.
- Protective coating by electro-galvanizing is acceptable.

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### 2.1.2 Non-metallic components

- All non-metallic components (gaskets, seals, etc.) in contact with the fluid shall be compatible with the fluid characteristics.

## 2.2 Electrical properties

Not applicable.

## 2.3 Other properties

Refer to the project specification requirements [5].

## 2.4 Prohibited materials, treatments and processes

Refer to the project specification requirements [5].

Materials in contact with hydraulic fluid based on phosphate esters shall not be:

- Nitrilcaoutchouc (NBR)
- Chloroprene elastomers (CR)
- Polyurethane elastomers (PUR)

## 3 Form, fit and function requirements

### 3.1 Design

#### 3.1.1 Isolating Valves

In order to reach a high degree of availability, each maintenance component, downstream of Isolating Valves in the pressure circuit should be replaced in operation, with fluid cleanliness and safety requirements respect. Drain valve, which shall be connected to the return circuit, permit the pressure circuit discharge, checkable with a test point, in order to guaranty the safety requirements. A single valve permits the return circuit isolation.

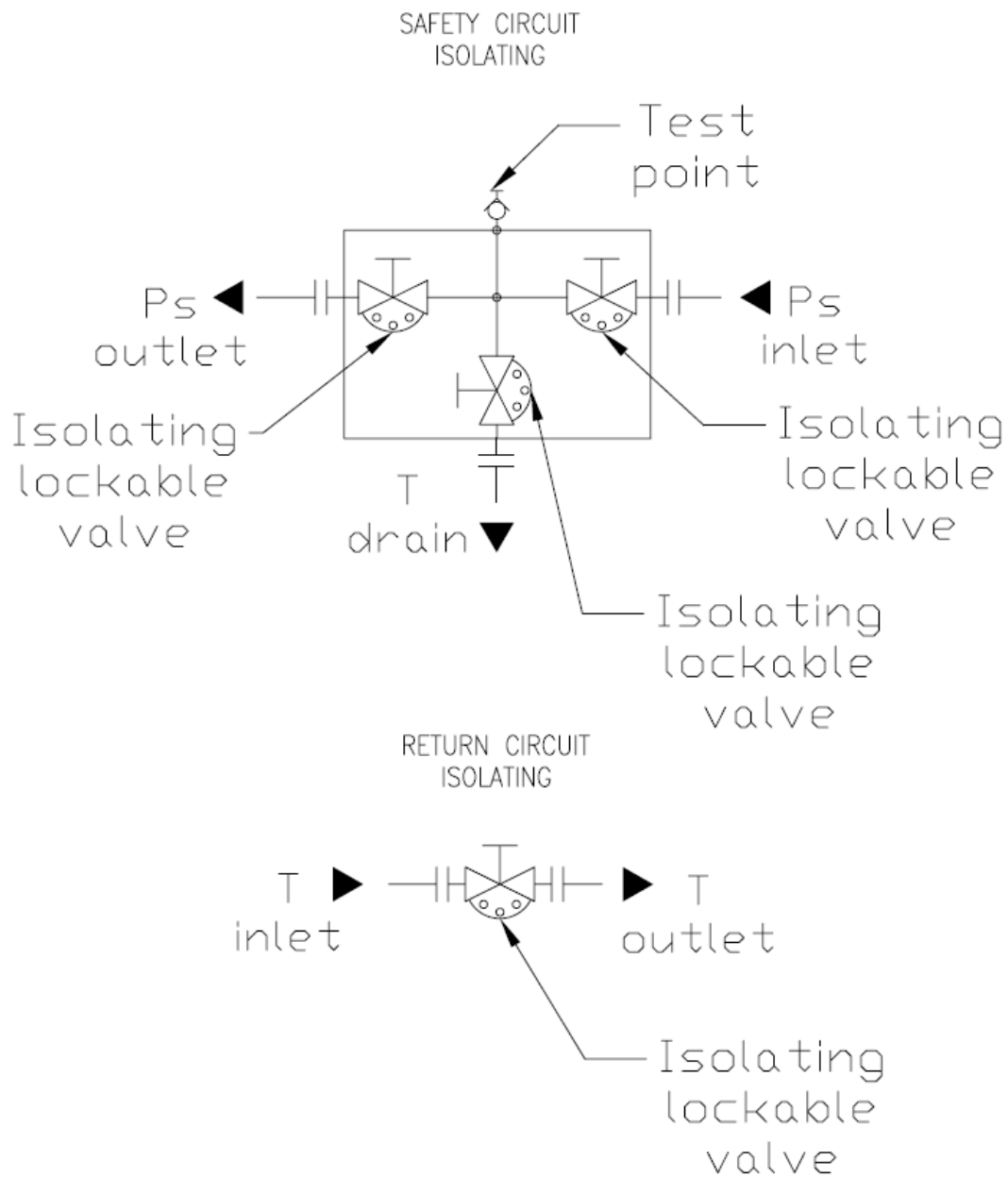
Isolating Valves shall be designed according to ASME B16.34 [3] and Standard specification for valves [9]

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### 3.1.2 Piping and Instrumentation Diagram

- Functional diagrams defined below shall be respected. Each deviation shall be submitted to the purchaser.
- Materials comply with the project piping class manual [6].



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## 3.1.3 Components Characteristics

	Component	Qty	Item	Characteristics
HP SV and LP SV Servomotors	Safety circuit Isolating Block, with: -Isolating lockable Valve (A) -Isolating lockable Valve (B) -Discharge lockable Valve (C)	10	4111-HYD-61**	ND 15 Data sheet : Appendix 1
HP SV and LP SV Servomotors	Return circuit Isolating Valve	10	4136-V-60**	ND 25 Data sheet : Appendix 2
HP CV and LP CV Servomotors	Safety circuit Isolating Block, with: -Isolating lockable Valve (A) -Isolating lockable Valve (B) -Discharge lockable Valve (C)	10	4111-HYD-61**	ND 15 Data sheet : Appendix 1
HP CV and LP CV Servomotors	Return circuit Isolating Valve	10	4136-V-60**	ND 50 Data sheet : Appendix 3

(\*\*) Refer to Scope of supply

## 3.1.4 Interfaces

- According to the International standards mentioned in 6.1.1 and Piping class manual [6]
- SAE connection shall be provided with welding counter flange.
- Refer to data sheets in Appendices

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## 3.2 Construction

### 3.2.1 Piping

- Pipe sizes shall be selected to provide fluid velocity in accordance with the following criteria:
  - Pump suction: < 0.8 m/s
  - Pressure circuits: < 5 m/s
  - Return pipes: < 2.5 m/s
  - Internal drains: < 1 m/s
- To minimize the risk of leakage, interconnecting piping and flanges should be kept to a minimum. The equipment shall be fitted on manifold blocks.
- Pipes and flanges shall comply with the project's piping class manual [6].

### 3.2.2 Lockable valves

- Valves shall be equipped with a padlock device to lock and tag them, in the open or closed position. The padlock device is large enough for 7 mm stem to pass through.

### 3.2.3 Instrumentation

- Test points
  - All test points shall be used with large process-security, without leakage and without interruption of operation. The instrument connection shall be made by a safety coupling « MINIMESS » type.

## 3.3 Hardware

Not applicable.

## 3.4 Reliability

### 3.4.1 Life time

The lifetime of the equipment is 40 years.

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### 3.4.2 Operation time

The equipment shall be designed to work on a continuous basis (24 hours per day, 7 days a week) except for maintenance.

### 3.4.3 Mean time between failure (MTBF)

Not applicable.

### 3.4.4 Mean time to repair (MTTR)

Not applicable.

## 3.5 Maintainability

The Isolating Valves shall be depolluted with no risk of damaging other component sensitive to pollution.

### 3.5.1 Maintenance and Accessibility

- Isolating Valves shall be easily dismantled.
- The supplier shall provide a list of maintenance tasks and inspections.

### 3.5.2 Maintenance in operation

Not applicable.

## 3.6 Availability

Isolating Valves shall be available 24 hours a day, 7 days a week during the lifetime of the equipment.

## 3.7 Interchangeability

All components having the same reference shall be directly and completely interchangeable with each other in compliance with the installation and function (no mechanical adjustment following item replacement shall be necessary).

The manufacturing of the replacing materials shall avoid any misplacing component. If necessary, the supplier can manufacture special shapes to make sure of no misplacing.

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### 3.8 Performance characteristics

#### 3.8.1 Noise

Not applicable.

#### 3.8.2 Vibration

Refer to the project specification requirements [5].

#### 3.8.3 Operation requirements

- Operation Fluid cleanliness
  - Contamination classification according to SAE AS 4059 < class 7
- Operation Fluid temperature
  - Minimum Temp 10 °C
  - Minimum Temp to start operation 35 °C
  - Nominal Temp 50 °C
  - Maximum Temp 60 °C
  - Maximum Temp before stop operation 70 °C
- Operation Pressure circuit
  - Refer to data sheets in Appendices

#### 3.8.4 Safety circuit Isolating Block for all HP&LP Valves Servomotors (ND15-Items 4111-HYD-61\*\*)

- Inlet isolating lockable Valve 4111-HYD-61\*\* (A):
  - Utile flow rate, 6 l/min
- Outlet isolating lockable Valve 4111-HYD-61\*\* (B):
  - Utile flow rate, 6 l/min
- Discharge lockable Valve 4111-HYD-61\*\* (C):
  - Utile flow rate: No flow required (pressure discharge)

#### 3.8.5 Return circuit Isolating Valve for **HP** CV and LP CV Servomotors (ND50)

- Isolating lockable Valve 4136-V-6201 to 4136-V-6210 :
  - Utile flow rate, 65 l/min

#### 3.8.6 Return circuit Isolating Valve for **HP** SV and LP SV Servomotors (ND25)

- Isolating lockable Valve 4136-V-6211 to 4136-V-6220 :
  - Utile flow rate, 10 l/min

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### 3.9 Energy efficiency

Not applicable

### 3.10 Human factors

The components are designed to provide maximum protection for people and equipment.

The components shall be subject to scheduled inspections for monitoring and maintenance purposes. Safe access to the circuit and its components is necessary.

### 3.11 Dimensions

Supplier's standard.

### 3.12 Weight

Supplier's standard.

### 3.13 Color

Not applicable.

### 3.14 Finish

Refer to the project specification requirements [5].

#### 3.14.1 Painting

Stainless steel parts shall not be painted.

### 3.15 Workmanship

Not applicable.

### 3.16 Batch and lot requirements

The supplier has to make a proposal of list of spare parts. It shall show at least: Description, references, associated quantities and associated lead time which shall be submitted to Purchaser approval, refer to Appendix 4.

Refer to the project specification requirements [5].

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### 3.17 Required documents

The supplier shall provide all the following documentation, written in English, to the Purchaser.

Pos.	Isolating Valves  Title of documents	Delivery dates	
		t1 = Site delivery date	
		t0 = date of signature of the contract	
		due date	Cross if needed
<b>1</b>	Planning & Engineering documentation		<b>X</b>
1.1	Time schedule (bar chart)	t0	<b>X</b>
1.2	Monthly progress report	Each month	<b>X</b>
1.3	Foundation drawing with loads, forces and civil requirements		
1.4	General arrangement & interface drawings	With the offer 6 weeks before t1	<b>X</b>
1.5	List of air consumers / data Sheet		
1.6	List of consumables		
1.7	List of cooling water consumers / Data Sheet		
1.8	List of documents, drawing list	5 weeks after t0	<b>X</b>
1.9	List of lubricants and lubrication points		
1.10	List of special tools and spare parts		
1.11	Noise Emission Sheet		
1.12	Vibration Emission Sheet		
1.13	Parts list / list of components	With the offer 5 weeks after t0	<b>X</b>
1.14	Piping and instrumentation diagram		
1.15	Sectional & assembly drawings	5 weeks after t0	<b>X</b>
1.16	Detailed drawings	5 weeks after t0	<b>X</b>
1.17	Technical data sheet (according to specific datasheet given with specification)	With the offer 6 weeks before t1	<b>X</b>
1.18	Static calculation		
1.19	Dynamic fluid & structure calculation		
1.20	Design justification memo		
1.21	Document reference table	With the offer 5 weeks after t0	<b>X</b>
1.22	Equipment functional analysis		
1.23	Complete studies for production		
<b>2</b>	I&C documentation		
2.1	Cable list		
2.2	Circuit / wiring diagram		
2.3	Connection diagram		
2.4	List of electrical consumer		
2.5	List of measuring points		
2.6	List of setting and limit values		
<b>3</b>	Quality assurance documentation		<b>X</b>
3.1	Manufacturing Report	6 weeks before t1	<b>X</b>
3.2	Inspection test plan		
3.3	Test certificates (Hydraulic tests & others)	t1	<b>X</b>
3.4	On site tests certificates	t1	<b>X</b>
3.5	Material test certificates (Content equivalent to level 3.1-EN10204)	6 weeks before t1	<b>X</b>

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Pos.	Isolating Valves  Title of documents	Delivery dates	
		t1 = Site delivery date	
		t0 = date of signature of the contract	
		due date	Cross if needed
3.6	Feedback for FMD studies including MTBF, MTTR.		
3.7	Complete FMEA/Hazop analysis for the equipment		
3.8	Quality assurance plan with witness points	6 weeks before t1	<b>X</b>
3.9	Declaration of conformity / Manufacturer certificate of compliance	6 weeks before t1	<b>X</b>
<b>4</b>	<b>Transportation &amp; Packing documentation</b>		<b>X</b>
4.1	Packing list with weights and dimensions	6 weeks before t1	<b>X</b>
4.2	Document of readiness for shipment	6 weeks before t1	<b>X</b>
4.3	Shipping and declaration documents	6 weeks before t1	<b>X</b>
4.4	Storage instructions	6 weeks before t1	<b>X</b>
<b>5</b>	<b>Erection, Operating &amp; Maintenance Manual (EOMM)</b>		<b>X</b>
5.1	EOMM in accordance with IBV WD0002	4 weeks before t1	<b>X</b>

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#### 4 Testing and verification requirements

The qualification plan shall include a conformity matrix including all the extracted requirements from this specification and the method used for qualification (calculation, test, etc.).

##### 4.1 Testing procedure

The supplier shall submit their Inspection tests with offer, in order to guaranty the performances required in this specification.

##### 4.1.1 Hydrostatic tests

- Pressure tests
  - Pressure tests according to ASME B16.34 [3] and ISO 5208 [4]
  - Valves and Manifold blocks shall be tested at 1.5x Nominal pressure for 30 minutes.

##### 4.1.2 Functional test

Not applicable.

##### 4.1.3 Non-destructive testing

Not applicable.

## 4.2 Records of material / performance tests

### 4.2.1 Records of material

The Inspection Sheet shall be supplied with the record values.

### 4.2.2 Performance tests

- A certified Performance test shall be carried out by the supplier on the completely assembled component.
- All performance criteria shall be tested and recorded, in the operating conditions.

## 5 Process requirements

Not applicable.

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## 6 Associated standards

### 6.1 Listing of applicable documents and standards

The table below gives Specific list of the codes and standards applicable for this equipment. For the detailed list of the applicable codes and standards refer to the project specification requirements [5].

#### 6.1.1 International standards or local equivalents

Table 1: International standards

N°	Standard	Title
[1]	SAE J. 518	Flanges
[2]	ISO 4413	Hydraulic Fluid Power – General Rules Relating to Systems
[3]	ASME B16.34	Valves-Flanged, Threaded and Welding End
[4]	ISO 5208	Pressure testing of metallic valves

#### 6.1.2 Purchaser documents

Table 2: Purchaser documents

N°	Reference	Title
[5]	RAW78S-----GS002	PROJECT GENERAL SPECIFICATION
[6]	RAW78S-----GS140	PIPING CLASS MANUAL (See only SE00 and SZ90)
[7]	HTGD690149	FLAME-RESISTANT HYDRAULIC FLUIDS
[8]	IBV WD0002	EXTERNAL SUPPLIER DOCUMENTATION TO BE INCLUDED IN THE EOMM
[9]	RAW78S-----GS070	STD SPECIFICATION FOR VALVES

## 6.2 Order of precedence

In case of conflict between equipment specification, international standards and purchaser documents, conflict point shall be discussed between the supplier and the purchaser for approval.

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## 7 Transportation and logistics requirements

### 7.1 Delivery requirements

- Refer to the project specification requirements [5].
- Isolating valves shall be shipped as a complete assembly.
- Oil removal from the inside of the components.
- All openings shall be sealed with blank flanges painted red.
- The packaged equipment shall be designed to withstand 12 months of storage in a closed shelter with a controlled atmosphere (temperature and humidity).
- Storage for more than 6 months may require special requirements. These requirements shall be given by the supplier to the purchaser, for approval.

### 7.2 Marking, identification requirements

Refer to the project specification requirements [5].

According to ASME B16.34

Every valve shall be provided with a solid label fixed in visible location.

The label shall include the tag number. Refer to Items on Scope of supply.

The identification labels have to be chosen according to the document “USI coding system”.

#### 7.2.1 Functional Label

A label plate with the following information shall be attached on each component:

- Function, Tag number and Set value (open/closed position indication).

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### 7.3 Packaging and preservation requirements

Refer to the project specification requirements [5].

The conditioning for the transport shall be done by the supplier in order to keep the integrity of the equipment.

Packaging shall be able to maintain the cleanliness level. All sealing device shall be controlled and repaired if needed.

- The equipment shall not contain residual fluid, based on phosphate esters during preservation period.
- In case the factory acceptance tests or preservation requirements are executed with a different fluid than the specified operation fluid, the Equipment shall be completely drained and cleaned before commissioning. It shall be insured that all the residual fluid is completely drained.

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#### 7.3.1 Protection

- The equipment shall be cleaned and preserved before shipping.
- Stainless steel parts shall not be coated.

### 7.4 Environment, health and safety requirements

Precautions shall be taken when using fire resistant hydraulic fluid based on phosphate esters.

In particular, direct contact should be strictly avoided and protective clothing should be worn.

Before the fluid is used, the Material Data Safety Sheet shall be consulted.

The equipment shall follow environment, health and safety standard ISO 14001 and OSHA 18001.

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**8 Notes**

**8.1 General notes**

Not applicable.

**8.2 Identification of changes**

Revision	Date	Changes made
A	15.11.2013	First Issue

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**9 Appendices**



## 9.1 Datasheets

### 9.1.1 Appendix 1 – Isolating Block with Valves for Safety Pressure circuit **Ps** (All Servomotors)

<b>1. GENERAL</b>			
Circuit	-	Safety Pressure ( <b>Ps</b> )	
Location (Indoor)	-	GSE, all HP&LP Valves Servomotors	
Manufacturer	-	#	
Manufacturer Reference	-	#	
Quantity of Sets	-	20	
Weight		#	
<b>2. CHARACTERISTICS</b>			
Oil Type		Fire resistant Oil, based on phosphate esters	
Viscosity to 50°C		# (27 cSt)	
Density to 50°C	Kg/m3	# (1145)	
Nominal diameter	ND	15	
Nominal pressure	bar	120	
Design pressure	bar	135	
Inlet Valve (A), Nominal Flow rate	lpm	#	
Inlet Valve (A) Pressure Loss (nominal Flow)	bar	#	
Outlet Valve (B), Nominal Flow rate	lpm	#	
Outlet Valve (B) Pressure Loss (nominal Flow)	bar	#	
Discharge Valve(C), Nominal Flow rate	lpm	#	
Discharge Valve (C) Pressure Loss (nominal Flow)	bar	#	
Service Type		Continuous	
<b>3. CONSTRUCTION</b>			
Design Temperature	°C	80	
Hydraulic Test Pressure (1,5 Nom. Press.)	bar	180	
Valve Type - Inlet (A)		#	
Valve Material - Inlet (A)		#	
Valve Type - Outlet (B)		#	
Valve Material - Outlet (B)		#	
Valve Type - Discharge (C)		#	
Valve Material - Discharge (C)		#	
<b>4. CONNECTIONS</b>			
Inlet Connection (Ps inlet)	-	SAE 3000 – 1/2" with Counter Flange	
Outlet Connection (Ps outlet)	-	SAE 3000 – 1/2" with Counter Flange	
Drain Connection (T)	-	SAE 3000 – 1/2" with Counter Flange	
Test point	-	#	

(#) Manufacturer to supply information

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9.1.2 Appendix 2 – Isolating Valve for Return Fluid circuit **T** (Stop Valves Servomotors)

<b>1. GENERAL</b>		
Circuit	-	Return Fluid <b>(T)</b>
Location (Indoor)	-	GFR, HP SV&LP SV Servomotors
Manufacturer	-	#
Manufacturer Reference	-	#
Quantity of Sets	-	10
Weight		#
<b>2. CHARACTERISTICS</b>		
Oil Type		Fire resistant Oil, based on phosphate esters
Viscosity to 50°C		# (27 cSt)
Density to 50°C	Kg/m3	# (1145)
Nominal diameter	ND	25
Nominal pressure	bar	1
Design pressure	bar	≥ 135*
Nominal Flow rate	lpm	#
Pressure Loss (nominal Flow)	bar	#
Service Type		Continuous
<b>3. CONSTRUCTION</b>		
Design Temperature	°C	80
Hydraulic Test Pressure (1,5 Nom. Press.)	bar	180
Valve Type		#
Valve Material		#
<b>4. CONNECTIONS</b>		
Inlet Connection	-	SAE 3000 – 1" with Counter Flange
Outlet Connection	-	SAE 3000 – 1" with Counter Flange

(#) Manufacturer to supply information

(\* ) To accept accidental value in case of an improper handling

9.1.3 Appendix 3 – Isolating Valve for Return Fluid circuit **T** (Control Valves Servomotors)

<b>1. GENERAL</b>		
Circuit	-	Return Fluid ( <b>T</b> )
Location (Indoor)	-	GFR, HP CV&LP CV Servomotors
Manufacturer	-	#
Manufacturer Reference	-	#
Quantity of Sets	-	10
Weight		#
<b>2. CHARACTERISTICS</b>		
Oil Type		Fire resistant Oil, based on phosphate esters
Viscosity to 50°C		# (27 cSt)
Density to 50°C	Kg/m3	# (1145)
Nominal diameter	ND	50
Nominal pressure	bar	1
Design pressure	bar	≥ 135*
Nominal Flow rate	lpm	#
Pressure Loss (nominal Flow)	bar	#
Service Type		Continuous
<b>3. CONSTRUCTION</b>		
Design Temperature	°C	80
Hydraulic Test Pressure (1,5 Nom. Press.)	bar	180
Valve Type		#
Valve Material		#
<b>4. CONNECTIONS</b>		
Inlet Connection	-	SAE 3000 – 2" with Counter Flange
Outlet Connection	-	SAE 3000 – 2" with Counter Flange

(#) Manufacturer to supply information

(\* ) To accept accidental value in case of an improper handling

## 9.2 Templates

### 9.2.1 Appendix 4 – Template for List of spare parts

	<b>Supplier: X</b>									
	<b>Description</b>	<b>Supplier Reference</b>	<b>Unit Price H.T. (euros)</b>	<b>Recommended Quantity</b>		<b>Reference of detailed drawing</b>	<b>Reference of Maintenance Manual and related page</b>	<b>Wear parts</b>		<b>Delivery lead time (weeks)</b>
				<b>Commissioning</b>	<b>Overhaul for 2 years</b>			<b>YES / NO</b>	<b>Frequency of replacement (weeks)</b>	

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