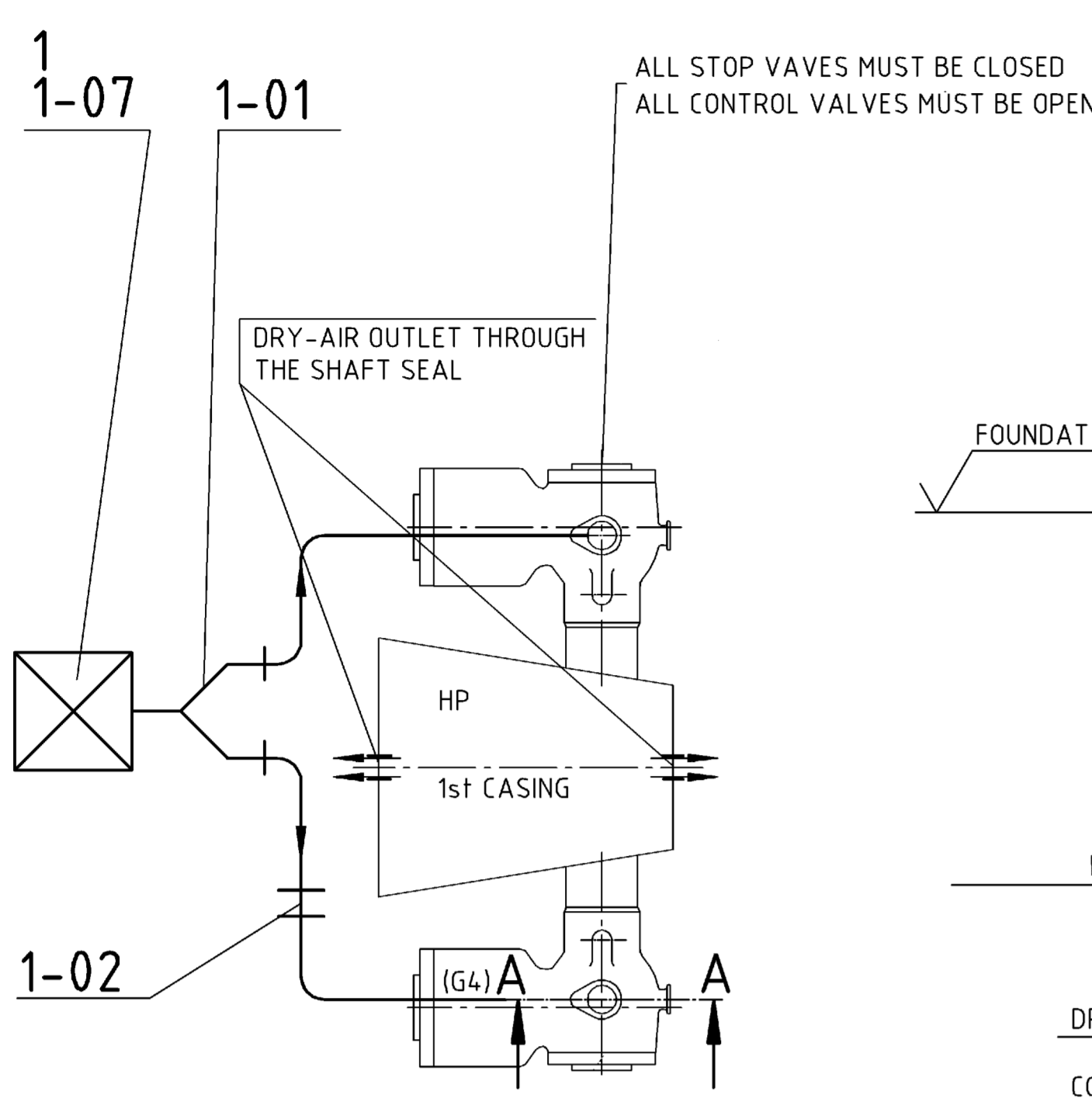


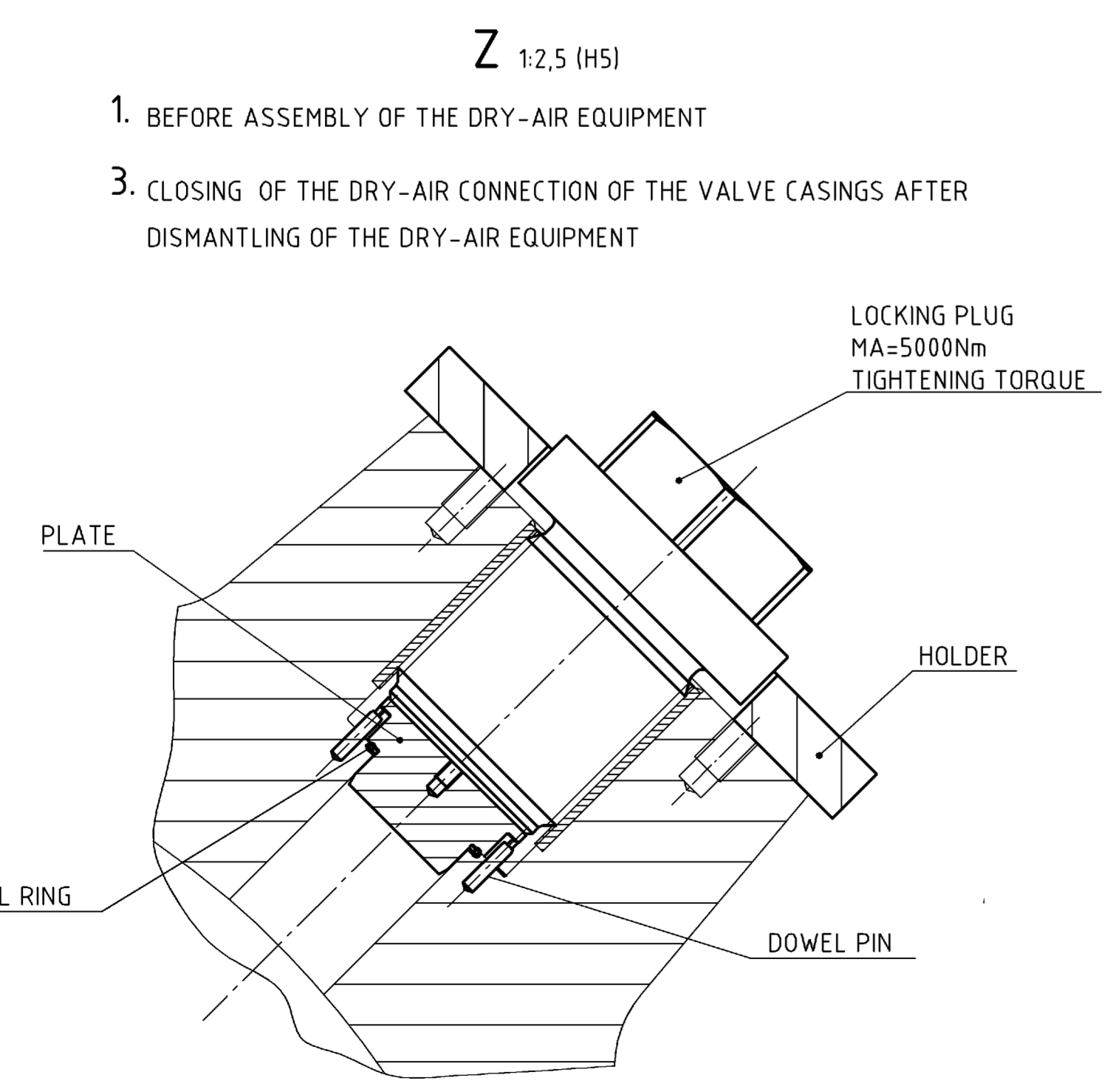
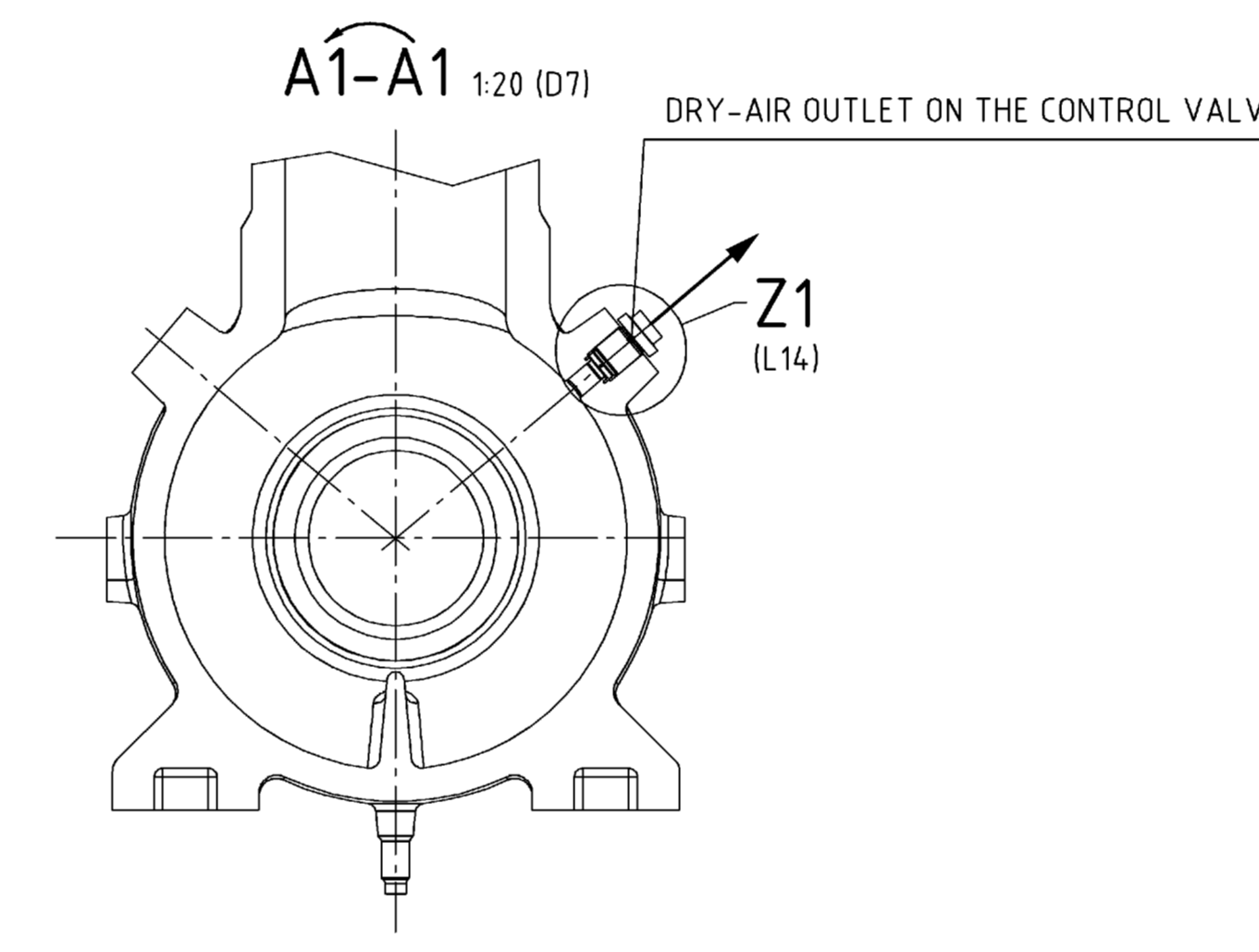
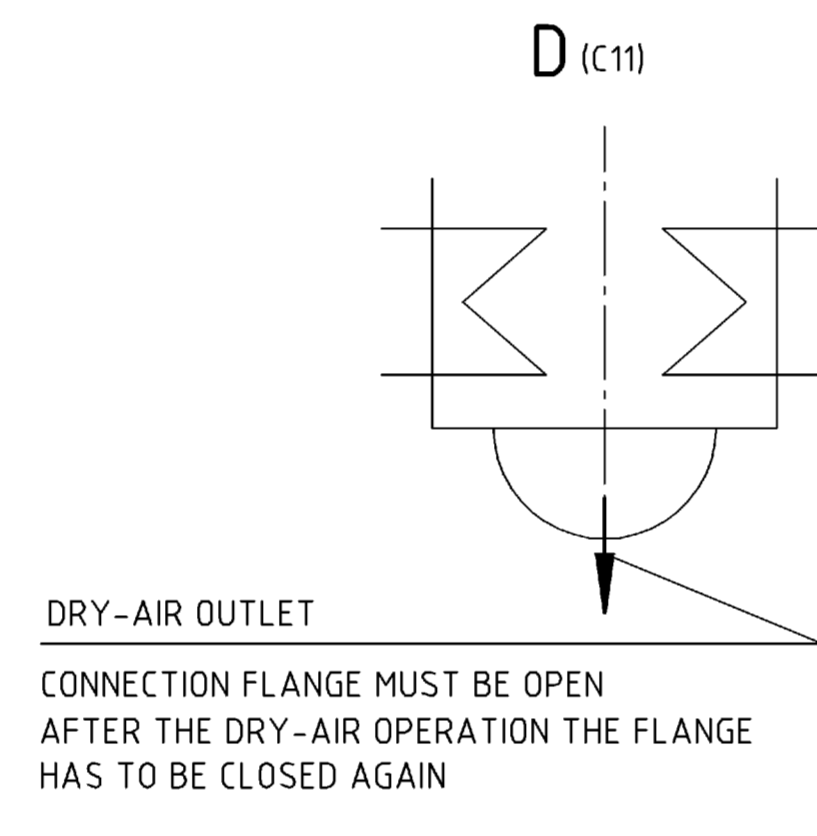
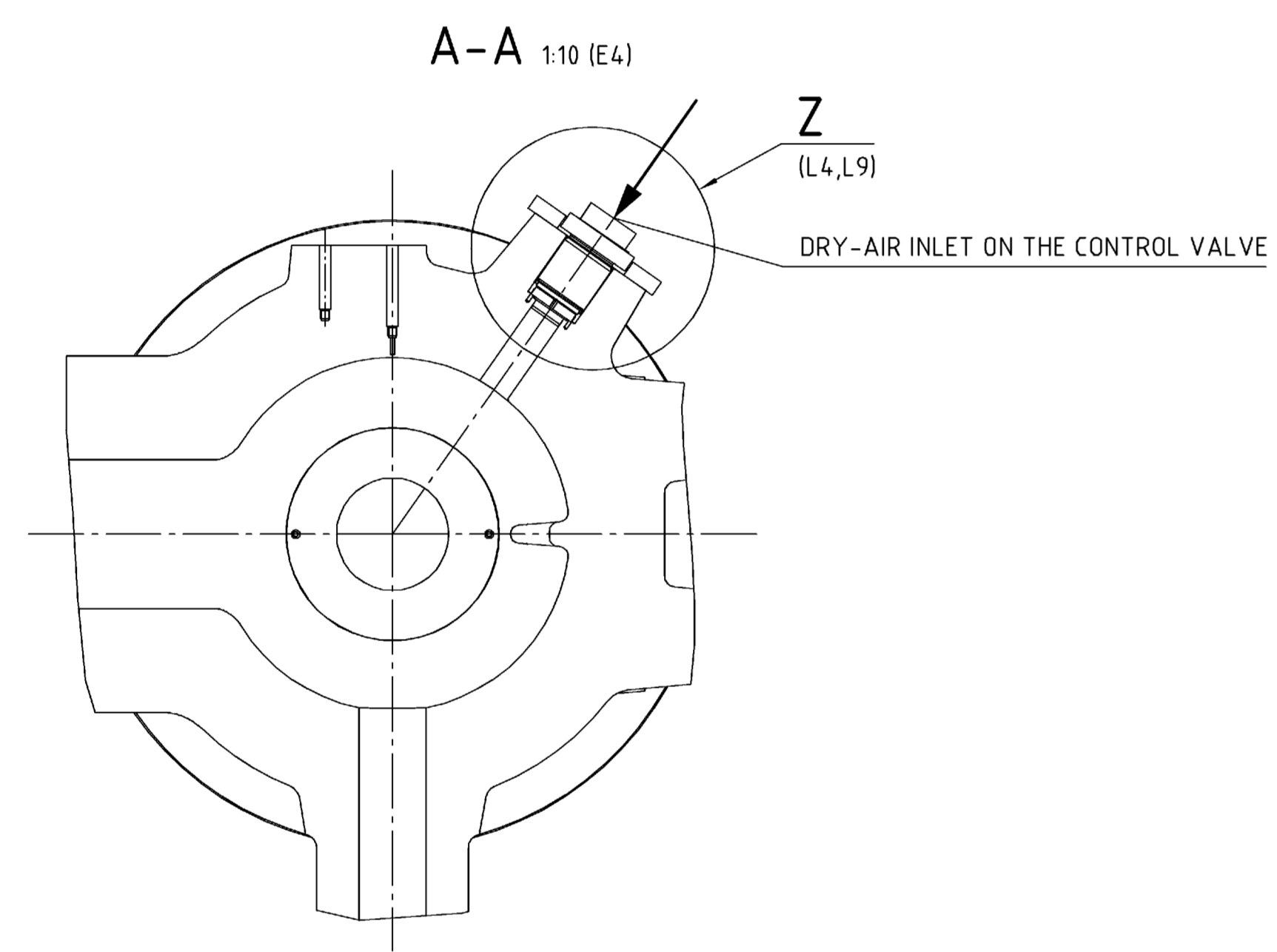
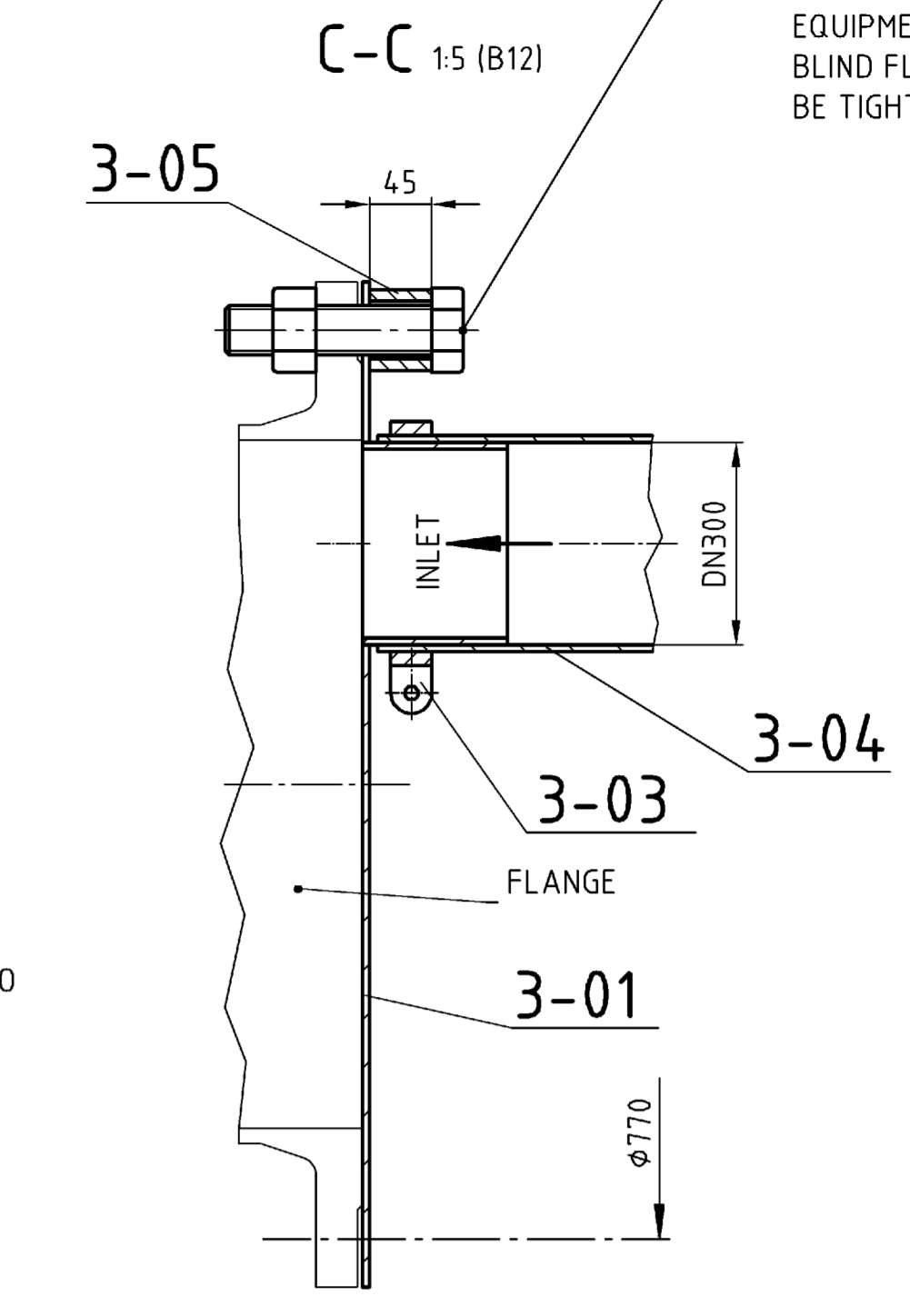
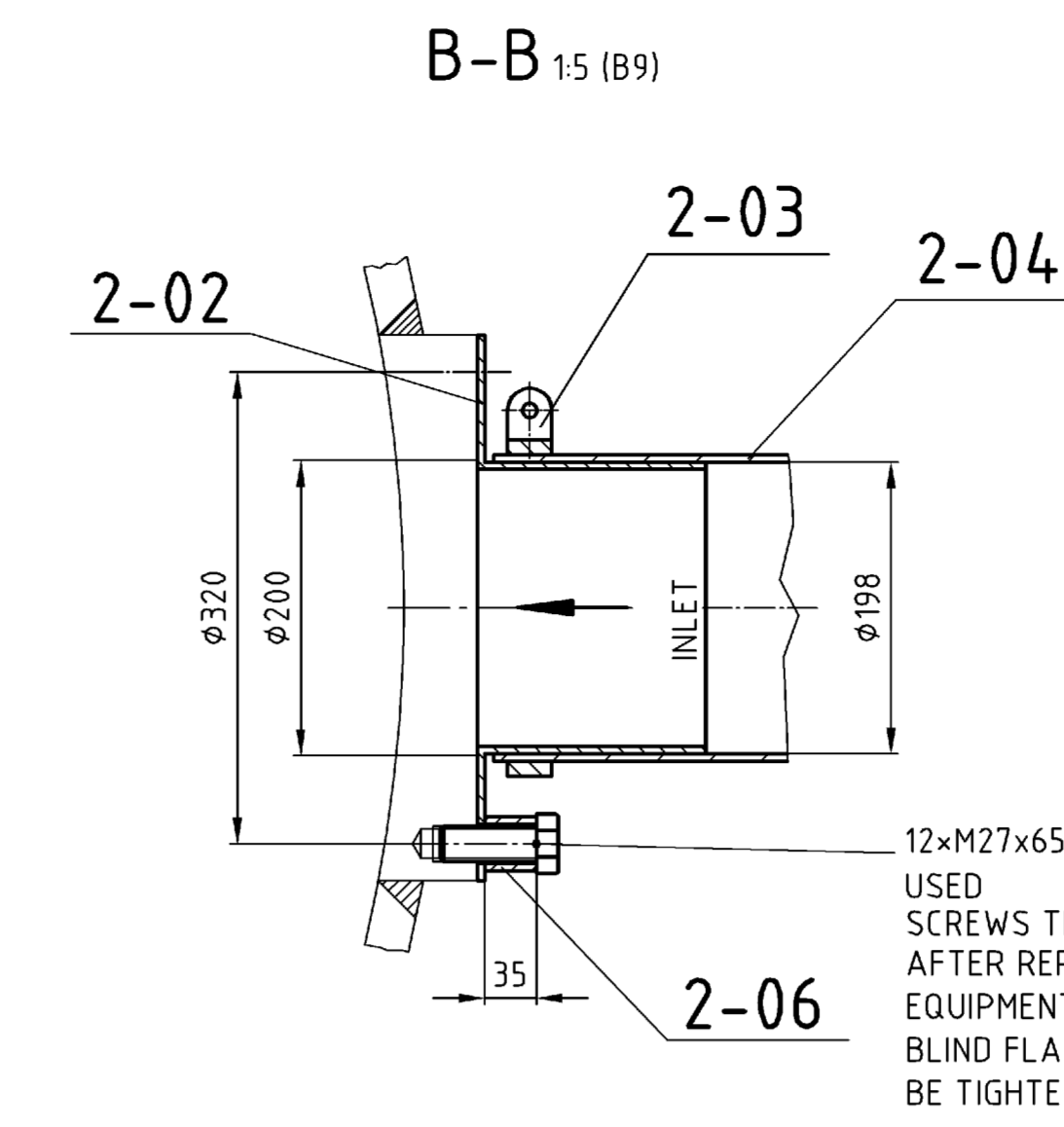
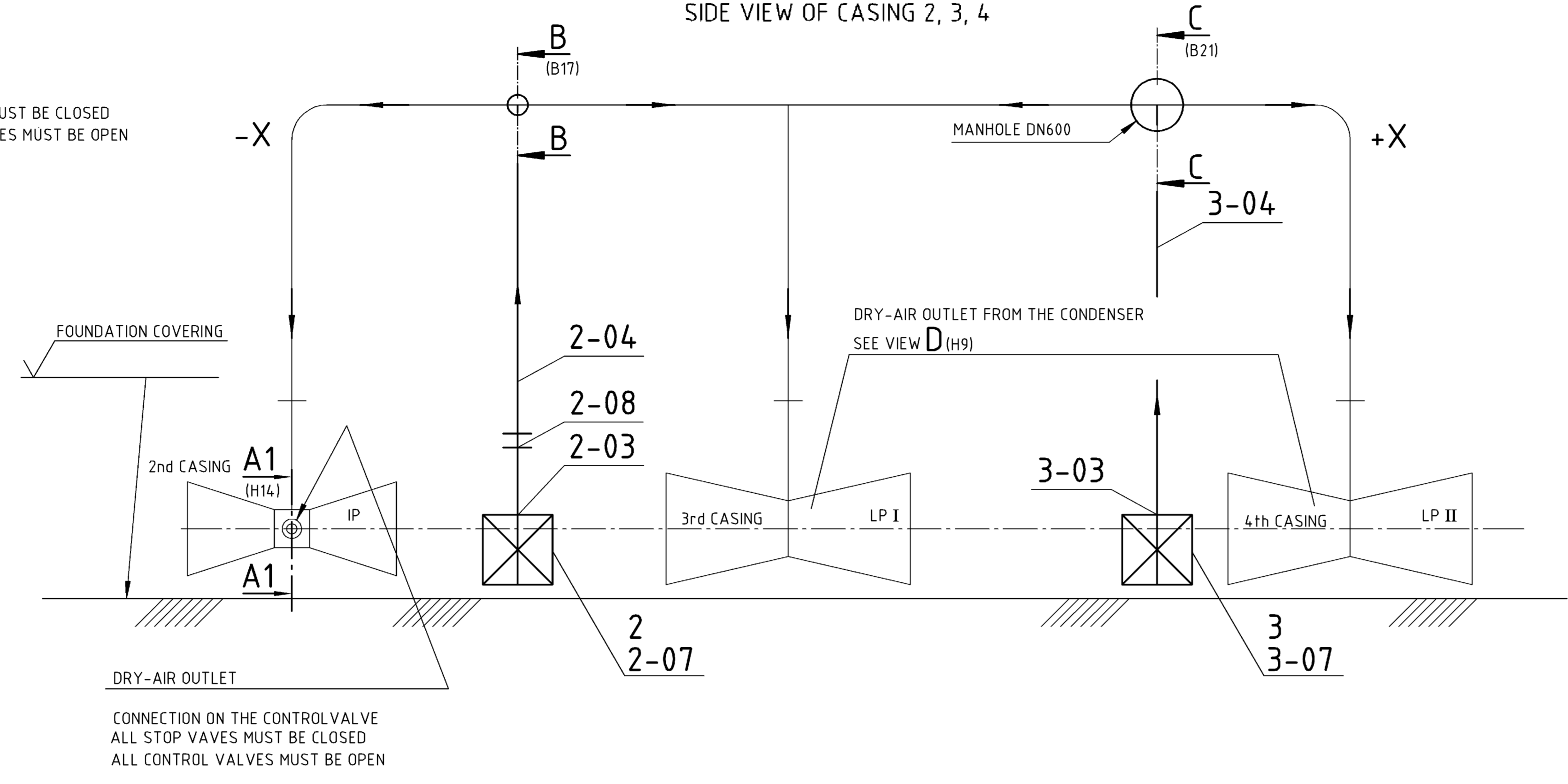
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For tender documents (Technical)
Tender no B/4011/2014/5532V1

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QAP NO. QP/BE/QP/328 rev 02	Pg. 3 to Pg. 5

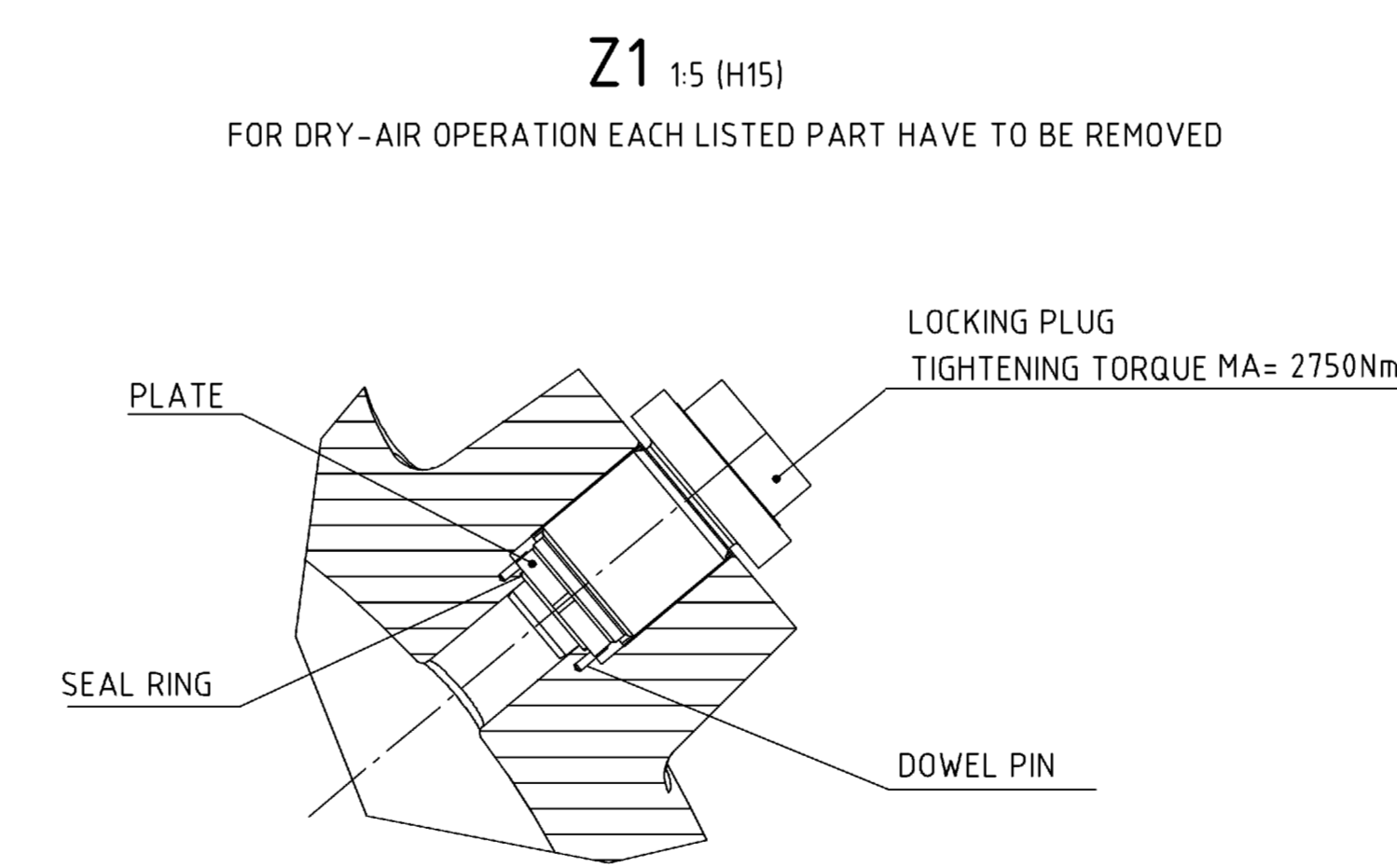
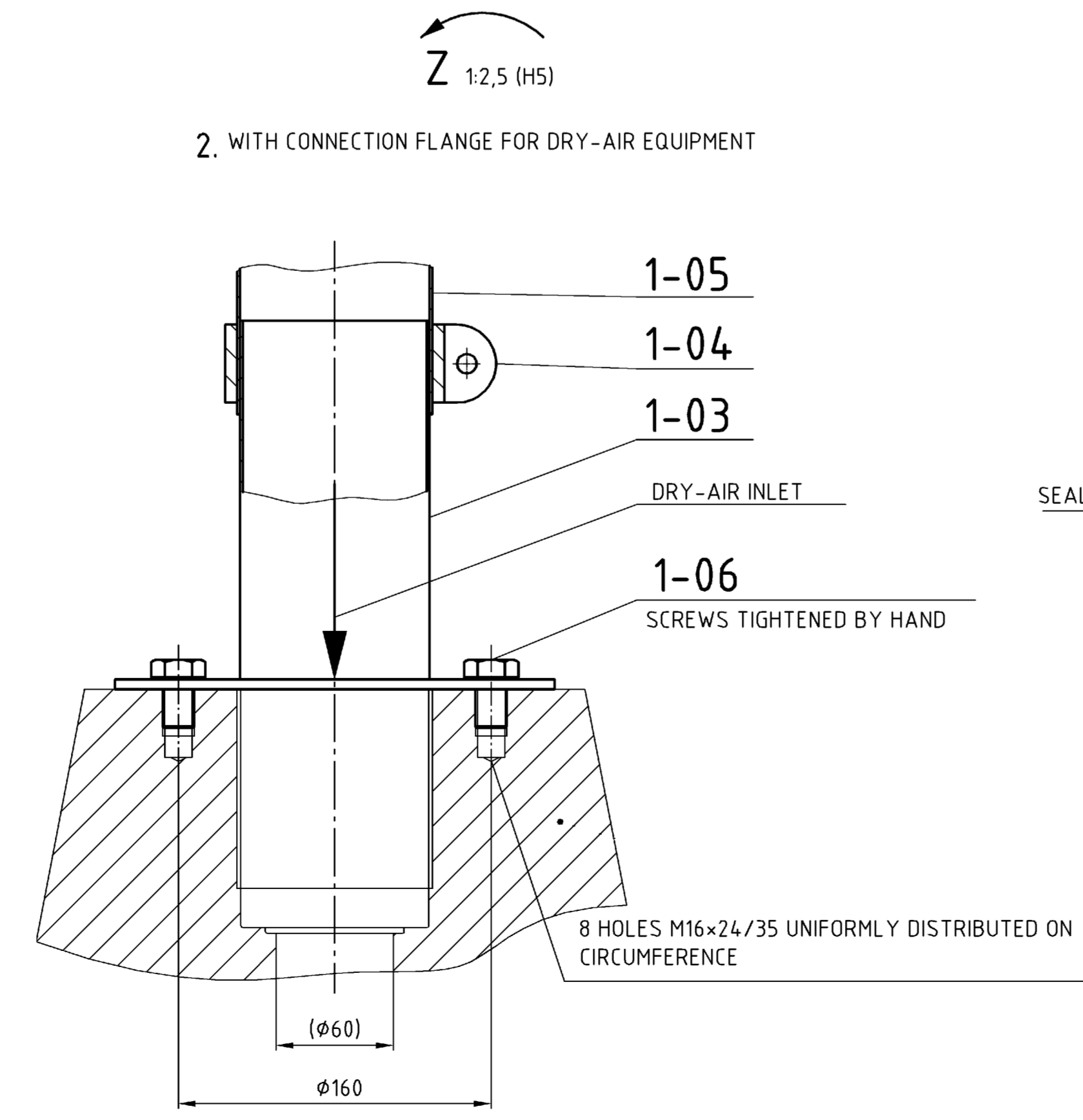
DRY-AIR EQUIPMENT OF HP
VIEW AT THE HP-TURBINE SECTION



DRY-AIR EQUIPMENT OF IP AND LP
SIDE VIEW OF CASING 2, 3, 4



- BEFORE ASSEMBLY OF THE DRY-AIR EQUIPMENT
- CLOSING OF THE DRY-AIR CONNECTION OF THE VALVE CASINGS AFTER DISMANTLING OF THE DRY-AIR EQUIPMENT



1. APPLICATION OF EQUIPMENT :

DRY AIR BLOWING EQUIPMENT SHALL BE USED FOR REMOVING THE MOIST AIR FROM TURBINE AND REPLACING IT WITH DRY AIR DURING SHUT DOWN OF TURBINE TO PREVENT CORROSION.

2. SPECIFICATION :

- THREE UNITS OF DRY AIR BLOWING EQUIPMENT AS PER BILL OF MATERIAL WITH THE FOLLOWING OUTLET CONDITIONS :
 - TEMPERATURE OF DRY AIR AT OUTLET MAX. 60 °C.
 - RELATIVE HUMIDITY < 11% AT AMBIENT TEMPERATURE.
 - PROVISION OF AIR FILTER(S) IN THE SYSTEM TO PREVENT THE DUST PARTICLES > 55 MICRON.
 - NOISE LEVEL AT FULL LOAD < 85 dB(A), WHEN MEASURED AT A DISTANCE OF 1 METRE AND HEIGHT OF 1.5 METRE.

3. GENERAL DESIGN FEATURES :

- THE DRY AIR BLOWERS(S) SHOULD BE SINGLE, COMPACT, PORTABLE & READY TO SWITCH IN UNIT AT SITE.
- IT SHOULD BE CAPABLE TO HANDLE TOTAL PRESSURE DROP IN THE SYSTEM.
- SUITABLE CONNECTION FOR CONNECTING THE HOSE PIPES SHALL BE DESIGNED AND INCORPORATED IN THE DRY AIR PRESERVATION SYSTEM BY THE SUPPLIER.
- THE EQUIPMENT SHALL BE SKID MOUNTED AND SHOULD NOT REQUIRE ANY FIXING WITH FOUNDATION.
- THE EQUIPMENT SHOULD BE ABLE TO OPERATE WITH 415 V-3 PHASE AND/OR 240 V A.C. MAIN SUPPLY.

4. PAINTING :

COLOUR SHADE RAL7035 (LIGHT GREY) OR 631 OF IS:5.

5. DOCUMENTS FOR ONE TIME APPROVAL :

- VENDOR'S OWN DRAWINGS INCLUDING BILL OF MATERIAL.
- POWER WIRING DIAGRAM OF MOTORS, HEATERS AND CONTROLS.
- DATA SHEETS OF MOTORS, HEATERS AND CONTACTORS.

6. TEST/GUARANTEE CERTIFICATE :

- PERFORMANCE CERTIFICATES FOR FLOW RATE, TEMPERATURE AND RELATIVE HUMIDITY OF DRY AIR AT OUTLET.
- PERFORMANCE CERTIFICATES FOR NOISE LEVEL.
- CERTIFICATE OF COMPLIANCE (COC) FOR MATERIAL & PERFORMANCE TEST OF ALL PARTS / ASSEMBLIES.

7. OPERATING MANUAL :

10 DVD (9 DVD FOR PROJECT SITE AND 1 DVD FOR BHEL, HARIDWAR) OF OPERATION & MAINTENANCE MANUAL, COVERING ALL ASPECTS OF INSTALLATION, OPERATION AND MAINTENANCE, ARE TO BE SUPPLIED.

NOTE :- ALL THE ITEMS SHOULD BE OFFERED AS MENTION IN TABLE-1 OR EQUIVALENT MODEL ACCEPTED BY BHEL.

ATTENTION !

- AFTER DISMANTLING OF THE DRY-AIR EQUIPMENT :-
- THE LOCKING PLUGS ON THE VALVE CASING HAVE TO BE TIGHTENED WITH THE MENTIONED TIGHTENED TORQUE IN DETAIL Z AND Z1
 - BEFORE ASSEMBLY OF THE LOCKING PLUGS A CHECK SHOULD BE PERFORMED ON ALL THE OTHER BUILT-IN PARTS INSIDE OF THE VALVE CASING SEE DETAIL Z AND Z1!

TABLE-1 (SEE : NOTE)

ITEM NO.	DESCRIPTION	MATERIAL	QTY	REMARK
01	DRYING PLANT		01	ASSEMBLY
1-01	Y-PIPE DN100/80/80	STEEL	01	PART
1-02	PLUG CONNECTOR DN80	STEEL	01	PART
1-03	CONNECTION DN80 PITCH DIAMETER-D160	STEEL	02	PART
1-04	HOSE CLAMP	STEEL	06	PART
1-05	HOSE DN80*5000	PVC	03	PART
1-06	HEXAGON HEAD SCREW M16*25	PROPERTY CLASS 8.8	16	PART
1-07	DEHYDRATING BREATHER M120, 230V, 50HZ, 1.28KW		01	PART
02	DRYING PLANT ML100		01	ASSEMBLY
2-02	COVER DN200 PITCH DIAMETER-D320	STEEL	01	PART
2-03	HOSE CLAMP DN200	STEEL	02	PART
2-04	HOSE DN200*10000	PVC	01	PART
2-06	SLEEVE 33.7*2, 6*35	STEEL	12	PART
2-07	DEHYDRATING BREATHER ML1100, 400V, 50HZ, 12.78KW		01	PART
2-08	REDUCER PIECE DN250/DN200	STEEL	01	PART
03	DRYING PLANT ML23		01	ASSEMBLY
3-01	FLANGE DN300 PITCH DIAMETER-D770	STEEL	01	PART
3-02	COVER DN300 PITCH DIAMETER-D450	STEEL	01	PART
3-03	HOSE CLAMP DN300	STEEL	04	PART
3-04	HOSE DN300*10000	PVC	02	PART
3-05	SLEEVE 48.3*5*45	STEEL	20	PART
3-06	SLEEVE 42.4*1*35	STEEL	16	PART
3-07	DRYING PLANT ML23, 400V, 50HZ, 29.61KW		02	PART

DIRECTION OF DRY-AIR FLOW

INVENTORY No: 15020388
 DRAWING No: 00089-9/2021-0
 PROJECT No: 00089-9/2021-0
 DATE: 13.08.12

GRADE OF UNTOL DIM
 MICG-C/MF/A0230208
 WELDING-A/B/C/D / A0621104
 GAS CUTTING-T3/A0621101

REV DATE ALTERED CHECKED
 02 18.02.15 MONIKA RITESH K.

AS PER C/A NO. STE-15-F0070.

AS PER C/A NO. STE-13-F0298

STATUS OF PROJ. DATE
 APPROVED NAME BSN

TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT
 STEAM TURBINE
 BHARAT HEAVY ELECTRICALS LTD.
 RANIPUR, HARIDWAR

DRM: AKASH
 CHD: AKASH
 APPD: D.K.RAY

DEPT STE SCALE WEIGHT (KG) REF. TO ASSY. DRG. ITEM NO. OF ITEMS
 CODE 4011 1:20 0-12076-58000 SH-1

TITLE: DRY AIR PRESERVATION SYSTEM
 CARD CODE: 0-12076-58000
 DRAWING NO. 0-12076-58000
 SHEET No. 01 No. OF SHEETS 01

MANUFACTURER'S NAME AND ADDRESS		STANDARD QUALITY PLAN				TO BE FILLED BY BHEL		TO BE FILLED BY BHEL		REMARKS	
BHEL		ITEM	OP NO.	QA/BE/OP/328	REV NO.: 02		FORMAT OF RECORDS		AGENCY		
VENDOR'S NAME AND ADDRESS		DRY AIR PRESERVATION SYSTEM / DRY BLOWING EQUIPMENT	REV NO.:	As Per PO	REV NO.:		M	B	N		
SL. NO.		CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	9	D	11	
1	2	3	4	5	6	7	8	9	D	11	
Page 1 of 3											

In coming / Raw Material / BOIs Inspection:											
1.0	Reactivation Air fan	Make, Model, Class, RPM, Rotation, & Discharge, Overall Dim.	Major	Visual	100 %	BHEL Approved Drawing	BHEL Approved Data Sheet	MTC	✓	P/ V	-
1.1	Reactivation Air Fan Motor	Make, Rating, RPM, Mounting Type, Frame Size, Sr. No.	Major	Visual	100 %	BHEL Approved Drawing /IS 325	BHEL Approved Data Sheet	MTC	✓	P/ V	-
1.2	Process Air fan	Routine & Type tests	Major	Verification	100 %	BHEL Approved Drawing/IS 325	BHEL Approved Data Sheet	MTC	✓	P/ V	-
1.3	Process Air fan	Make, Model, Class, RPM, Rotation & Discharge, Overall Dimensions	Major	Visual	100 %	BHEL Approved Drawing	BHEL Approved Data Sheet	MTC	✓	P/ V	-
1.4	Process Air Fan Motor	Make, Rating, RPM, Mounting Type, Frame Size, Sr. No.	Major	Visual	100 %	BHEL Approved Drawing	BHEL Approved Data Sheet	MTC	✓	P/ V	-
1.5	Bed Drive Motor	Make, Rating, RPM, Mounting Type, Frame Size, Sr. No.	Major	Verification	100 %	BHEL Approved Drawing/IS 325	BHEL Approved Data Sheet	MTC	✓	P/ V	-
1.6	Circuit Breakers, Transformer, Contractors, Relays, Thermo-state, Indicating Lights, Timer, Heaters,	Make, Rating & Model	Major	Visual	100 %	BHEL Approved Drawing	BHEL Approved Data Sheet / BOM	MTC	✓	P/ V	-

MANUFACTURER / SUBCONTRACTOR		LEGEND		FOR CUSTOMER USE	
		I RECORDS IDENTIFIED WITH 'TICK' (✓) SHALL BE ESSENTIALLY INCLUDED BY CONTRACTOR IN QA DOCUMENTATION. M- MANUFACTURER / SUBCONTRACTOR B: BHEL / NOM. INSPECTION AGENCY N: CUSTOMER INDICATE 'P' PERFORM 'W' WITNESS AND 'V' VERIFICATION ALL 'W' INDICATED IN COLUMN 'N' SHALL BE 'CHP' OF CUSTOMER		APPROVED BY: <i>[Signature]</i> APPROVED BY: <i>[Signature]</i> APPROVED BY: <i>[Signature]</i>	

8

6

MANUFACTURER'S NAME AND ADDRESS		STANDARD QUALITY PLAN				TO BE FILLED BY BHEL		TO BE FILLED BY BHEL		REMARKS								
BHEL	VENDOR'S NAME AND ADDRESS	ITEM	DRY AIR PRESERVATION SYSTEM / DRY BLOWING EQUIPMENT	QP NO.	QA/BE/OP/328	REFERENCE DOCUMENT	7	ACCEPTANCE NORMS	8	FORMAT OF RECORDS	9	AGENCY	M	B	N	10	11	
		DRG. NO.	As Per PO	REV. NO.	02													
		REV. NO.	As Per PO	SPEC. NO.														
		REV. NO.	As Per PO															
		REV. NO.	As Per PO															
SL. NO.	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK													
1	2	3	4	5	6													

3.5		Temperature & Relativity of Dry Air at Outlet	Major	Measurement	100%	Drawing BHEL Approved Drawing	BHEL Approved Procedure	Test Report	√	P	W	-
3.6		Noise Level	Major	Measurement	100%	BHEL Approved Drawing	BHEL Approved Procedure	Test Report	√	P	W	-
3.7		Performance Characteristic Curve	Major	Measurement	100%	BHEL Approved Drawing	BHEL Approved Procedure	Curve	√	P	W	-
3.8		Colour Shade, Paint Thickness (DFT), Finish Aesthetic & Adhesion	Major	Visual	100%	Approved Painting Scheme / Instructions	Approved Painting Scheme / Instructions / Drawing	Inspection Report	√	P	W	-
4.0		Identification, Labelling, Marking & Packing:										
4.1		Identification & Labelling	Major	Visual	100%	BHEL Approved Drawing	BHEL Approved Drawing	Inspection Report	-	P	V	-
4.1		Marking & Packing	Major	Visual	100%	BHEL Approved Drawing	BHEL Approved Drawing	Inspection Report	-	P	-	-

Note: Manufacturer to maintain calibrated instruments having better accuracy than the item under test. Inspection engineer shall check the same during inspection.

(Handwritten signature)

MANUFACTURER / SUBCONTRACTOR	FOR CUSTOMER USE	FOR CUSTOMER USE
	LEGEND: I RECORDS IDENTIFIED WITH 'TICK' (✓) SHALL BE ESSENTIALLY INCLUDED BY CONTRACTOR IN QA DOCUMENTATION M: MANUFACTURER / SUBCONTRACTOR B: BHEL / NOM. INSPECTION AGENCY N: CUSTOMER INDICATE 'P' PERFORM 'W' WITNESS AND 'V' VERIFICATION ALL 'W' INDICATED IN COLUMN 'N' SHALL BE 'CHP' OF CUSTOMER	APPROVED BY: <i>(Signature)</i> Shah BHEL Assurance BHEL Handwar