

Project: **Fire-safe test**

Client: **Metso Automation Oy Helsinki, Finland**

Office: **Helsinki**

Client's Order Number: -

Date: **03 May 2010**

Order Status: **Complete**

Inspection Dates

First: **23 April 2010**

Final: **23 April 2010**

This certificate is issued to **Metso Automation Oy** to certify that undersigned surveyor attended their works in Helsinki on the above date for purpose of witnessing fire tests of one (1) soft seated full bore ball valve manufactured by Metso Automation Oy Helsinki, Finland.

Particulars of valve

Type: **XG04DWTAJ2SPDMBA+D**

Rating: **ASME Class 300**

Size: **NPS 4"**

Materials (as stated by the Manufacturer): See Appendix No. 2 of the test report.

Testing

The test valve was presented by the manufacturer, without choice. The test was conducted in accordance with the standard ISO 10497- 5: 2004- identical with API 607, Fifth Edition, June 2005. Throughout the test the valve performed satisfactorily and met all the requirements of the above standard. Visual examination after testing confirmed that the design was in accordance with the manufacturer's drawing and parts list. A copy of the test report has been endorsed.

Before commencing the tests the testing apparatus was examined and found to be in accordance with the above standard.

This fire test qualifies also the following valve types:

XG04, XG05, XG06, XG08



Päivi Björkestam
Surveyor to Lloyd's Register EMEA

A member of the Lloyd's Register Group

FIRE TEST FOR BALL VALVE, TYPE XG04DWTAJ2SPDMBA + D

2 (4)

OBJECT: Fire test of ball valve XG04DWTAJ2SPDMBA + D in accordance with standard ISO 10497- 5: 2004 - identical with API 607, Fifth Edition, June 2005.

SPECIMEN: The test valve XG04DWTAJ2SPDMBA + D is a soft seated full bore ball valve manufactured by METSO AUTOMATION OY Helsinki, Finland. The valve is designed for bi-directional installation. The size of the valve is NPS 4" and pressure class of the body is ASME 300. The manual actuator M12 was mounted on the test valve.

The assembly drawing, parts list, dimensional drawing of the valve and dimensional drawing of the manual actuator are enclosed in Appendices 1, 2, 3 and 4. Nameplate details and location of temperature measurement points are shown in Appendix 5.

TESTS: The valve had been tested before the fire test by the manufacturer according to normal factory procedure.

The valve was assembled between two end flanges equipped with a 25 mm water pipe.

The valve was filled with water for the fire test and the pressure of water against the closed ball was 2 bar during the test. The test was conducted at the Laboratory of METSO AUTOMATION (FC RTD) OY Helsinki on April 23, 2009.

The temperatures and test pressures during the test were recorded with a data logger. The results are shown in Appendices 6. The temperature measurement points were located according to the test standard.

The flame temperature was raised to the required level in less than 2 minutes and after that the valve was heated with gas burners for 35 minutes and it was cooled with water-spray to lesser than 100 °C. The cooling time was 6 minutes.

**FIRE TEST FOR BALL VALVE,
TYPE XG04DWTAJ2SPDMBA + D**

3 (4)

The through-seat leakages and external leakages of the test valve during the test are shown in Table 1.

TABLE 1.
April 23, 2010

TEST PHASE	TIME	LEAKAGE	
	min.	ml/min	
		measured	allowed
Start	0	0	
Required flame temperature	2	0	
Seat leakage during heating	37	7	400
External leakage heating + cooling	42	10	100
Seat leakage after cooling	48	1	160

In visual examinations after the test it was stated that the test valve was in full operating condition and complied with the supplied documents.

SUMMARY: On the basis of the results it can be stated that the tested ball valve XG04DWTAJ2SPDMBA + D met the requirements presented in standards ISO 10497- 5: 2004 and API 607, Fifth Edition, June 2005.

Juha Perttilä
Laboratory Manager
METSO AUTOMATION OY
FC RTD

Päivi Björkestam
Surveyor to Lloyd's
Register

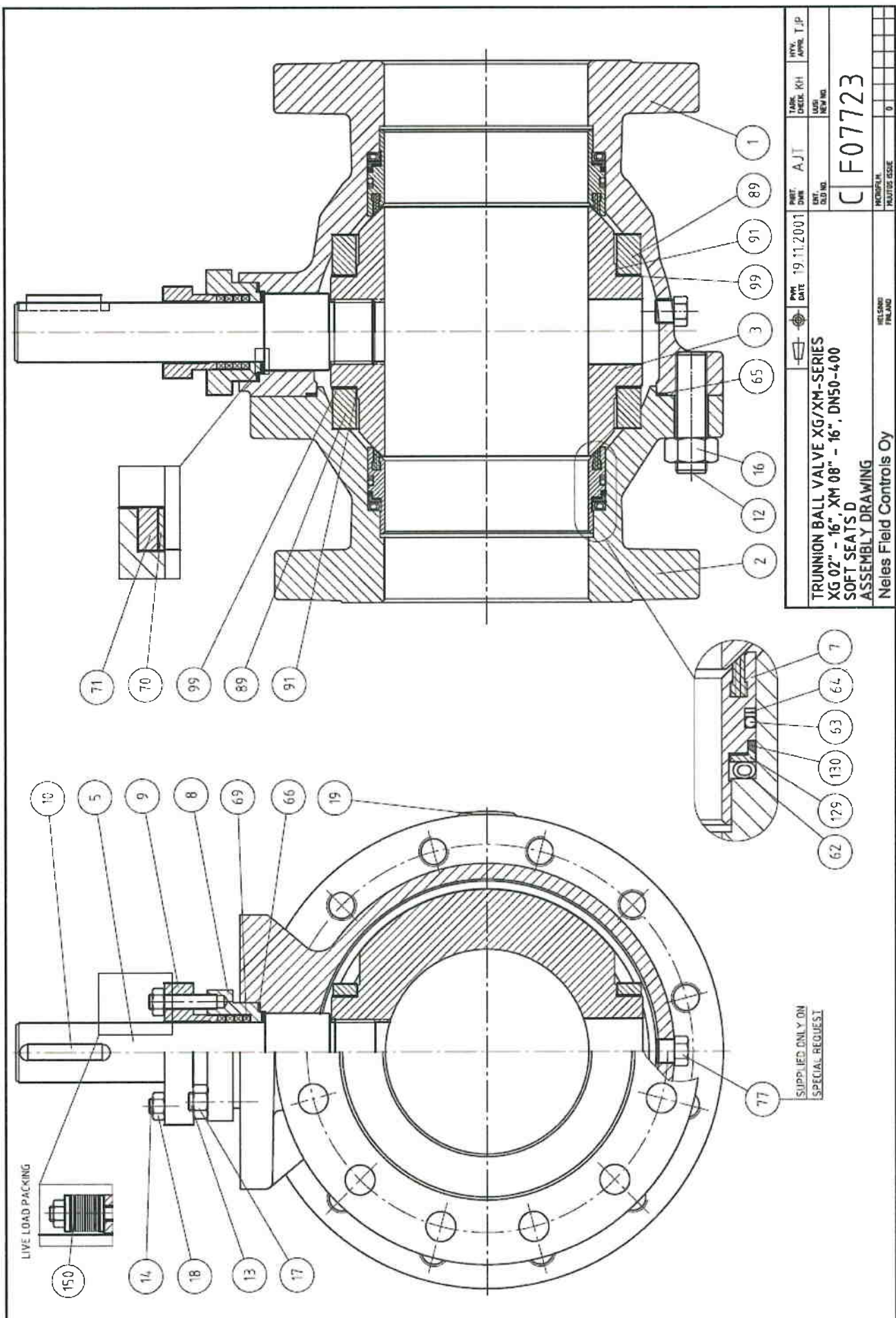


**FIRE TEST FOR BALL VALVE,
TYPE XG04DWTAJ2SPDMBA + D**

4 (4)

APPENDICES:

1. Assembly drawing C F07723
2. Parts and material list H082418
3. Dimension drawing 40004000152
4. Manual actuators dimension drawing.
5. Nameplate details. Location of temperature measurement points.
6. Temperatures and pressure measurement results during the test.





Customer C-Bom

XG04CWT AJ2SPDMBA+D

Serial Number: PCON_00497261

Id-code: 4000400152_01_0003_01 Rev: 0

Page 1(1)

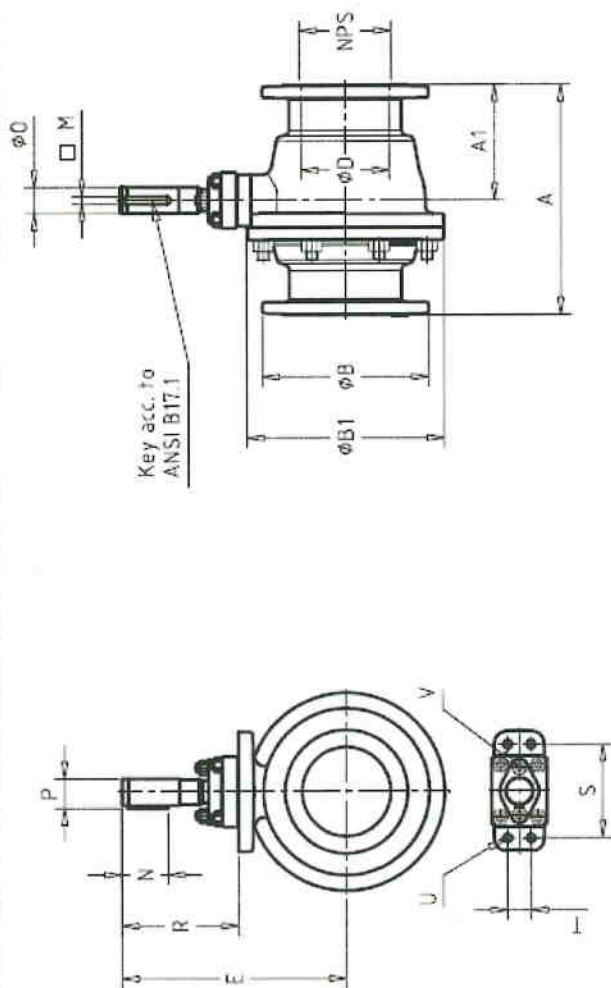
Part	Id-code	Description	Material	Qty	Spare part categories
001	H027000	BODY	ASTM A216 gr WCB	1	
002	H027001	BODY CAP	ASTM A216 gr WCB	1	
003	H001895	BALL	ASTM A351 gr CF8M	1	3
005	H014160	SHAFT	ASTM A479 gr XM-19	1	3
007	H051300	BALL SEAT	AISI 316+PTFE+C25	2	2
008	H017861	BONNET	ASTM A105	1	
009	47360	GLAND	A351 gr CF8M/1 4408	1	
010	3097	KEY	EN 10088-1 4460	1	3
012	235034	STUD	ASTM A193 gr B7	8	
013	3484	STUD	ASTM A193 gr B7	4	
014	H002070	STUD	ASTM A193 gr B7	2	
016	3345	HEXAGON NUT HEAVY	ASTM A194 gr 2H	8	
017	3342	HEXAGON NUT HEAVY	ASTM A194 gr 2H	4	
018	3342	HEXAGON NUT HEAVY	ASTM A194 gr 2H	2	
019	H028251	IDENTIFICATION PLATE	ASTM A194 gr 2H	2	
062	187201	SPRING	AISI 304	1	
063	232655	O-RING	UNS N06625	2	2
064	201061	STRIP	VITON CF (FKM)	2	
065	004-0630-36	BODY GASKET	PTFE	2	
066	236995	SHEET RING	GRAPHITE+AISI 316	1	
069	233406	PACKING RING	GRAPHITE+AISI 316	1	
070	H002072	THRUST BEARING	GRAPHITE+PTFE	4	
071	H002075	THRUST BEARING	STELL 6B	1	3
077	3482	HEXAGON PLUG	UNS S21800	1	3
089	H014221	TRUNNION PLATE	ASTM A105	1	
091	H002055	THRUST BEARING	ASTM A743 gr CA15	2	
099	H000689	TRUNNION BEARING	ALLOY 6	2	3
129	H046161	SUPPORT RING	PTFE+AISI 316	2	3
130	233446	BACK SEAL	AISI 316	2	
150	979560	DISC SPRING SET	GRAPHITE	2	
			EN 10083-1 8159+ENP	2	

Trunnion Mounted Full Bore MBV Ball Valve
TRUNNION BALL VALVE XG/XM-SERIES

Documents IMO's 1 X72 EN.0
Customer assembly drawing F07723.0

Notes:

Spare part categories: 1 = Recommended and spares (always needed), 2 = Basic repair (eg. changing of the seat/valve or leverage repair/actuator), 3 = Full repair (eg. changing of the closing element/valve). For full overhaul = select categories 1 + 2 + 3



Key acc. to
ANSI B17.1

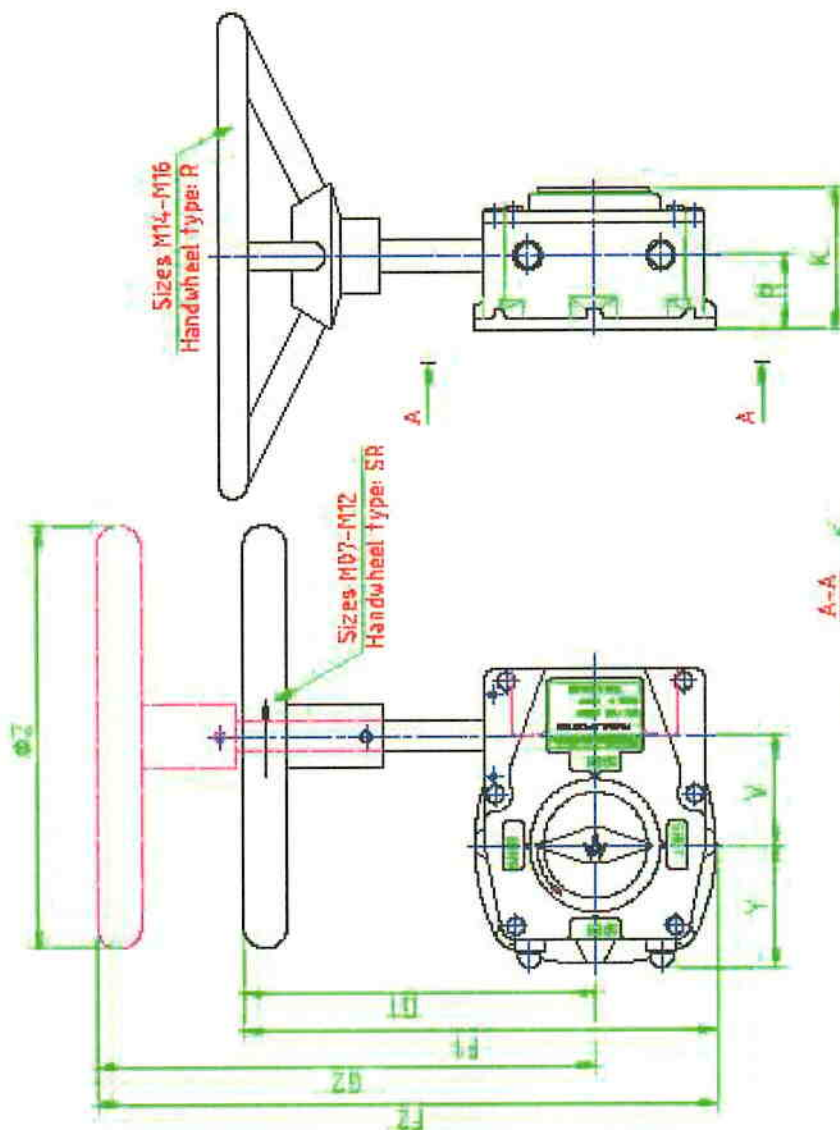
TYPE	DN	DIMENSIONS mm																Kg
		A	A1	AB	AB1	BD	E	EM	N	BO	P	R	S	T	U	V		
XG	50	216	89	165.1	146	50.8	203	4.763	35	20	22.163	125	110	32	1/2	5/16	15	
	80	282	162	209.6	200	76.2	225	4.763	35	20	22.163	125	110	32	1/2	5/16	32	
	100	305	182.5	254	254	101.6	296	6.35	46	25	27.75	156	130	32	1/2	3/8	58	
	150	403	201.5	317.5	353	152.4	373	9.525	68	40	44.225	188	160	40	5/8	3/8	125	
	200	502	251	381	462	203.2	453	9.525	68	40	44.225	208	160	55	3/4	3/8	225	
	250	568	284	445	552	254	562	12.7	90	55	60.6	270	230	90	1	1/2	330	
	300	648	324	521	626	304.8	605	12.7	90	55	60.6	270	230	90	1	1/2	630	
	350	762	381	584	700	340	761	19.05	134	75	83.5	354	307.4	120	1 1/4	3/4	800	
400	838	440	648	800	390	770	22.225	146	85	94.625	364	307.4	120	1 1/4	3/4	805		

TYPE	DN	DIMENSIONS mm																Kg
		A	A1	ØB	ØB1	ØBD	E	7H	H	ØH	P	R	S	T	U	V		
XM	200	457	229	343	426	203.2	453	9.525	68	40	44.225	208	160	55	3/4	3/8	190	
	250	533	267	407	514	254	562	12.7	90	55	60.6	270	230	90	1	1/2	325	
	300	610	305	483	592	304.8	605	12.7	90	55	60.6	270	230	90	1	1/2	480	
	350	686	343	533	665	340	741	19.05	134	75	83.5	354	307.4	120	1 1/4	3/4	635	
	400	762	381	597	750	390	779	22.225	146	85	94.25	366	307.4	120	1 1/4	3/4	840	

Page 2 contains same information in imperial units. This is a page 1/2

FACE-TO-FACE DIMENSIONS ACC. TO ASME B16.10
PRESSURE RATINGS: XG=ASME 300, XM=ASME 150
FLANGED, FULL BORE
Valve is shown in closed position

BALL VALVE XM/XG 2"-16" DIMENSION DRAWING		DATE 30.10.2000	REV. R15	CHK. RKM	APP. TJP
C F04529		ENT. OLD NO.			
Notes Field Controls Oy		REVISION FINLAND			



UNIT SIZE	M07	M10	M12	M14	M15	M16
INPUT TORQUE, MI [kg]	22.7	45.5	89.5	111	166	170
MAX OUTPUT TORQUE, MI [mm]	259	500	1009	1000	36.09	6509
TURNS TO CLOSE	10	10	10.5	15	17	22
HANDSHEEL DIA. 2	185	240	254	457	457	670
EN WITH STANDARD INPUT SHAFT	562	169	200	270	330	394
PT WITH STANDARD INPUT SHAFT	196	227	285	370	457	549
R2 WITH EXTENDED INPUT SHAFT	-	239	282	354	486	486
E3 WITH EXTENDED INPUT SHAFT	-	307	360	453	532	634
V	38.5	57	66.7	89.5	123	154
Y	45	56	75	86	114	170
K	58	67	81	93.5	109.5	166.5
R	24.5	35	42	50	59	94
MAX STERN HEIGHT	51	57	72	81	92	113
MAX VALVE SHAFT DIA	25	25	30	45	55	70
SPLINES; ANSI B92.1-1970	SWT 28A1	SWT 31A1	SWT 36-28	LWT 36-28	4LT 36-28	4LT 10-28
WEIGHT [kg]	2.9	5	9.5	18	30.7	55.2
VALVE ADJUSTING FLOUSE	F05	F10	F12	F14	F16	F16
ISO 52N TYPE	50 T8	102	125	140	165	165
S	5	6	7	8	9	10
N. NUMBER OF HOLES	4	4	4	4	4	4
U DIA	PHS	PHS	PHS	PHS	P20	H20
COROTH	6	8.5	16	21.5	25	25
DEPTH	6	8.5	16	21.5	25	25

NOTE: LOOK ALSO DRAWING NR. 313230 ABOUT STANDARD AND SPECIAL MODELS
LOOK ALSO DRAWING NR. 313231 ABOUT STANDARD AND MBV DRIVE-BUSHES

MASTERGEAR MANUAL OPERATOR
SERIES MD7..M16

DIMENSION DRAWING

NETES-JAMESBURY

Supplies: 2451 812 1-1976

N = number of holes

Drive bush Information:
See drawing nr: 313231

C 313229

1987年10月

NAMEPLATE DETAILS

TYPE : D1FY02DAH02/D

No. : H082418

BODY : _WCB_

Tmax : _+230 °C_

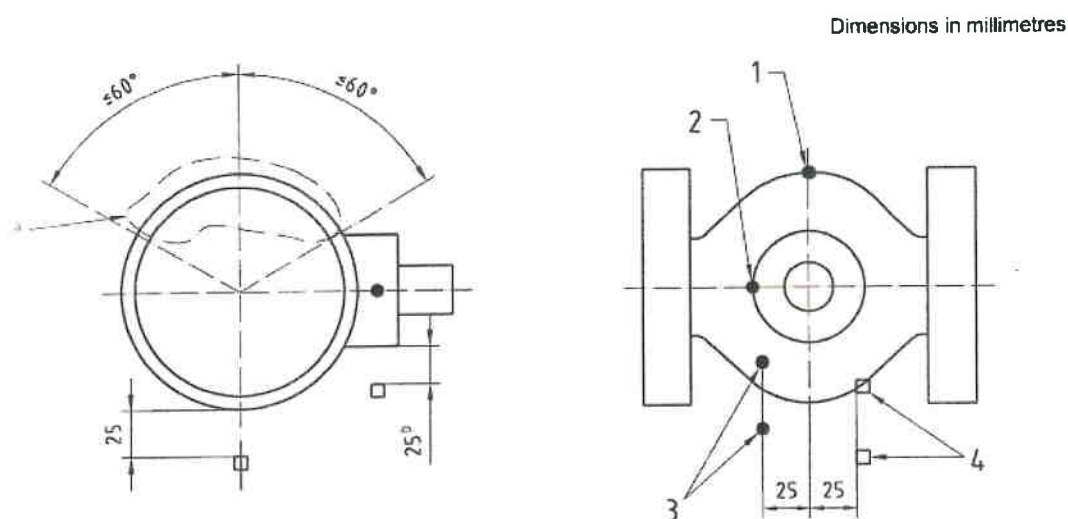
TRIM : _CF8M_

Tmin : _-29 °C_

SHAFT : _CF8M_

RATING : _ASME 300_

SEAT : _316 – PTFE-C25_ dPs : _51.6 BAR_

**Key**

- 1 body thermocouple
- 2 bonnet thermocouple
- 3 flame thermocouples
- 4 flame calorimeter cubes

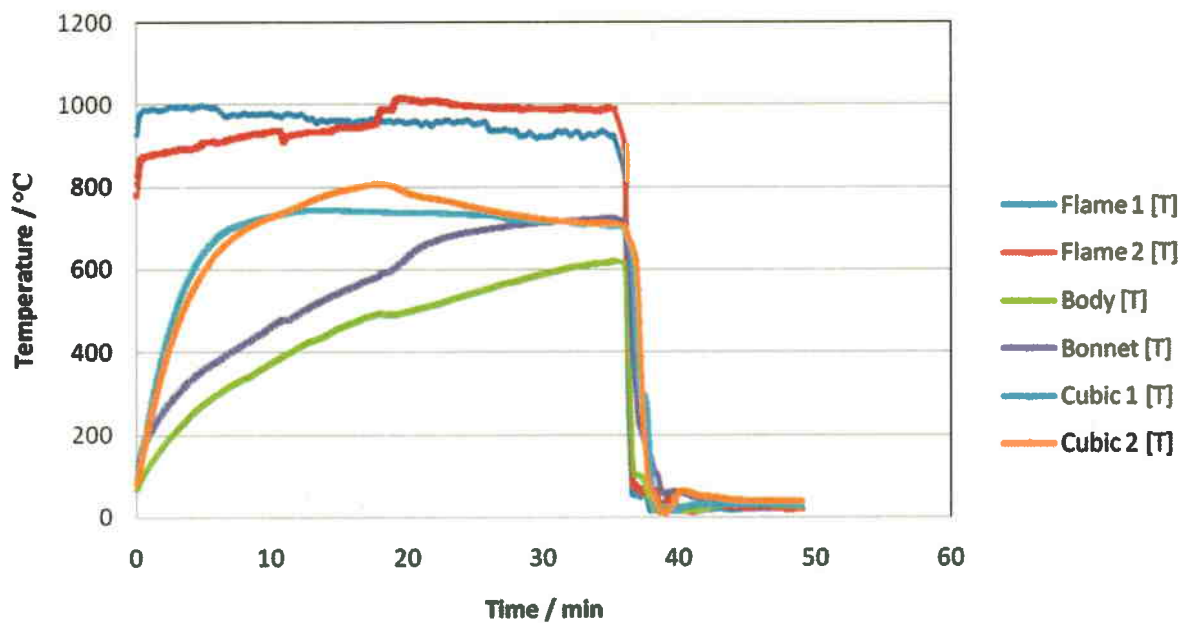
^a The body thermocouple is installed in this area. When installed, the body and bonnet thermocouples are recessed into the valve body/bonnet a distance of 1/2 the thickness of the wall or 13 mm, whichever is the lesser.

^b From the stem seal.

**Figure 3 — Location of temperature measurement sensors — Soft-seated valves up to DN 100 —
NPS 4 — PN 10, PN 16, PN 25 and PN 40 — Class 150 and Class 300**

Temperature-Time-graph

Valve type: XG04DWT AJ2SPDMBA+D



Pressure-Time-graph

