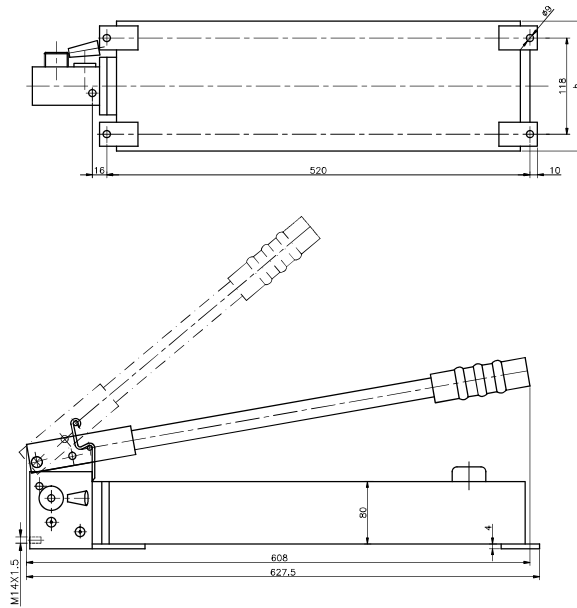


DRAWING NO. 11394501018



ITEM NO.-1(HYDRAULIC PUMP)

TECNICAL DATA

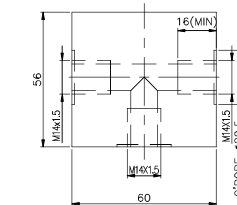
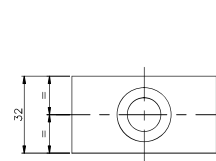
OIL CAPACITY	5.2L
USABLE OIL CAPACITY	4.5L
OPERATING PRESSURE	800 BAR
DELIVERY/PISTON STROKE LP	10 CM3
AUTOMATIC SWITCH OVER AT	100 BAR
DELIVERY/PISTON STROKE HP	1.6 CM3
WEIGHT INCL. OIL	13.4
TEST PRESSURE	970 BAR

TECHNICAL REQUIREMENTS:-

1. THE SCHEME PROVIDED HERE IS FOR GUIDANCE. SUPPLIER TO PROVIDE THEIR OWN DETAILED DRAWINGS WITH SCHEME AT THE TIME OF OFFER FOR APPROVAL OF BHEL.
2. VENDOR TO PROVIDE GENERAL ARRANGEMENT DRAWING OF THE ASSEMBLY WITH BILL OF MATERIAL AT THE TIME OF OFFER.
3. TESTING OF INDIVIDUAL COMPONENTS IS TO BE DONE AS PER DETAILS ON SHEET-2&3.
4. THE COMPLETE HYDRAULIC UNIT AFTER ASSEMBLY AT VENDOR WORKS TO BE HYDRAULICALLY TESTED AT 540kg/cm2 FOR 10Min. NO LEAKAGE IS ALLOWED (WORKING PRESSURE=450kg/cm2).

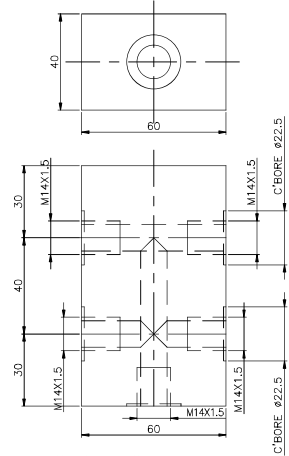
PURCHASED

W90413902617



OPERATIONAL PRESSURE = 500BAR
TEST PRESSURE = 750BAR
MATERIAL = STEEL

ITEM NO 8(OIL DISTRIBUTOR)



OPERATIONAL PRESSURE = 500BAR
TEST PRESSURE = 750BAR
MATERIAL = STEEL

ITEM NO 9(OIL DISTRIBUTOR)

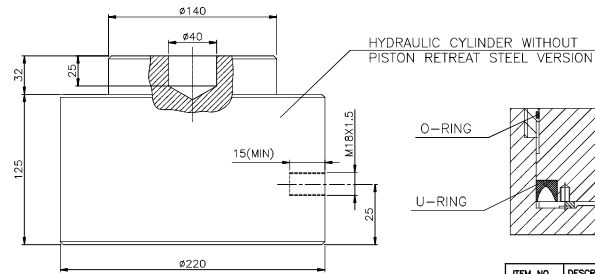
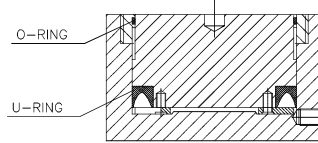
10	SEALING RING VAR 01	20	REFER SHEET 1 FOR DETAILS
09	OIL DISTRIBUTOR(1X4)	2	REFER SHEET 2 FOR DETAILS
08	OIL DISTRIBUTOR(1X2)	2	REFER SHEET 2 FOR DETAILS
07	VALVE COUPLING HALF-II	13	REFER SHEET 1 FOR DETAILS(INCLUDE 3 NOS SPARE)
06	VALVE COUPLING HALF-I	13	REFER SHEET 1 FOR DETAILS(INCLUDE 3 NOS SPARE)
05	SUPER PRESS HOSE VAR 01	5	L=12M
04	SUPER PRESS HOSE VAR 00	10	L=4M
03	SEALING RING VAR 00	16	REFER SHEET 1 FOR DETAILS
02	HYDRAULIC CYLINDER WITH SPARE PARTS	10	REFER SHEET 1 FOR DETAILS
01	HYDRAULIC PUMP	4	REFER SHEET 3 FOR DETAILS
S.NO.	ITEM DESCRIPTION	QTY.	REMARKS

THDF 115/67

NAME OF CUSTOMER/ PROJECT

GRADE OF UNTOL. DIM:-	01394501007	STATUS OF Dwg
M/CG- V/C/M/F AA 0230208	APPROVED	NAME
WELDING-A/B/C/D-AA621104	EMT	SIGN
GAS CUTTING-T3A0621101		DATE
REV. DATE	ALTERED	AMSHRA
01	27.5.14	CHECKED
CHANGES DONE AS PER	AMSHRA	RS/C
CHANGE ADVICE NO TGE-14-F0159		

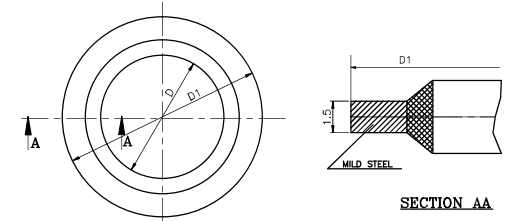
DEPT. TGE	SCALE	WEIGHT(Kg.)	REF. TO ASSY. DRG.	ITEM NO.	NO. OF SHEETS
CODE 4133	NTS	507	01394501007	01	3
TITLE			DRAWING NO.		
HYDRAULIC UNIT ASSEMBLY			11394501018		
			SHEET NO.3		

11394501018
DRAWING NO.ITEM NO. 02 HYDRAULIC CYLINDER
SCALE 1:2

ITEM NO.	DESCRIPTION	QTY
1	O-RING	01
2	U-RING	01

HYDRAULIC CYLINDER SPARE PARTS

PRESSURE FORCE, NOM. VALUE	1000KN
PRESSURE EFFECTIVE	1005KN
IMPACT SURFACE (PISTON)	201CM ²
OPERATING PRESSURE MAX	500BAR
REQUIRED OIL VOLUME MAX	0.643L
STROKE	32MM
WEIGHT	35KG
MATERIAL	STEEL

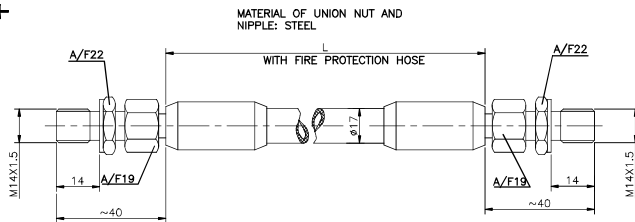


MATERIAL DESCRIPTION:-

SEALING RING -MILD STEEL RING PLATED WITH BRASS OR CADMIUM.
VULCANISED DOUBLE LIP SEAL-SIMRIT .70 NBR/120 OR EQUIVALENT
BASE: ACRYLONITRILE-BUTADIENE RUBBER
HARDNESS 70 SHORE A

ITEM NO 03.10
(SEALING RING)

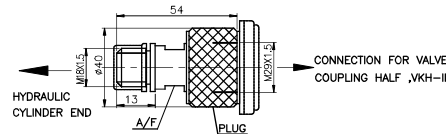
ITEM NO.	D	D1	VAR
ITEM NO.10	14.7	22	01
ITEM NO.03	18.7	22	00



THE HOSE SHOULD BE WITH FIRE PROTECTION COVER &
SUITABLE FOR AN OPERATIONAL PRESSURE OF 700BAR
HYDRAULIC TEST PRESSURE 1000BAR FOR 30MINUTES.

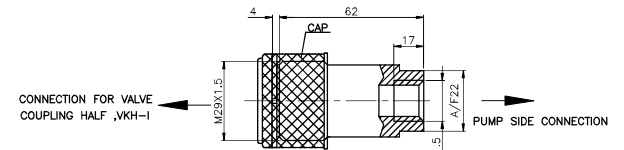
ITEM NO.4.5

ITEM NO.	L (M)	VAR.
ITEM 04.	5(M)	00
ITEM 05.	12(M)	01



OPERATIONAL PRESSURE = 500BAR
TEST PRESSURE = 750BAR
FLOW RATE = 15 L/min.
MATERIAL = STEEL

ITEM NO 06 (VALVE COUPLING HALF-I)



OPERATIONAL PRESSURE = 500BAR
TEST PRESSURE = 750BAR
FLOW RATE = 15L/min.
MATERIAL = STEEL

ITEM NO 07 (VALVE COUPLING HALF-II)

PURCHASED

W90413902617

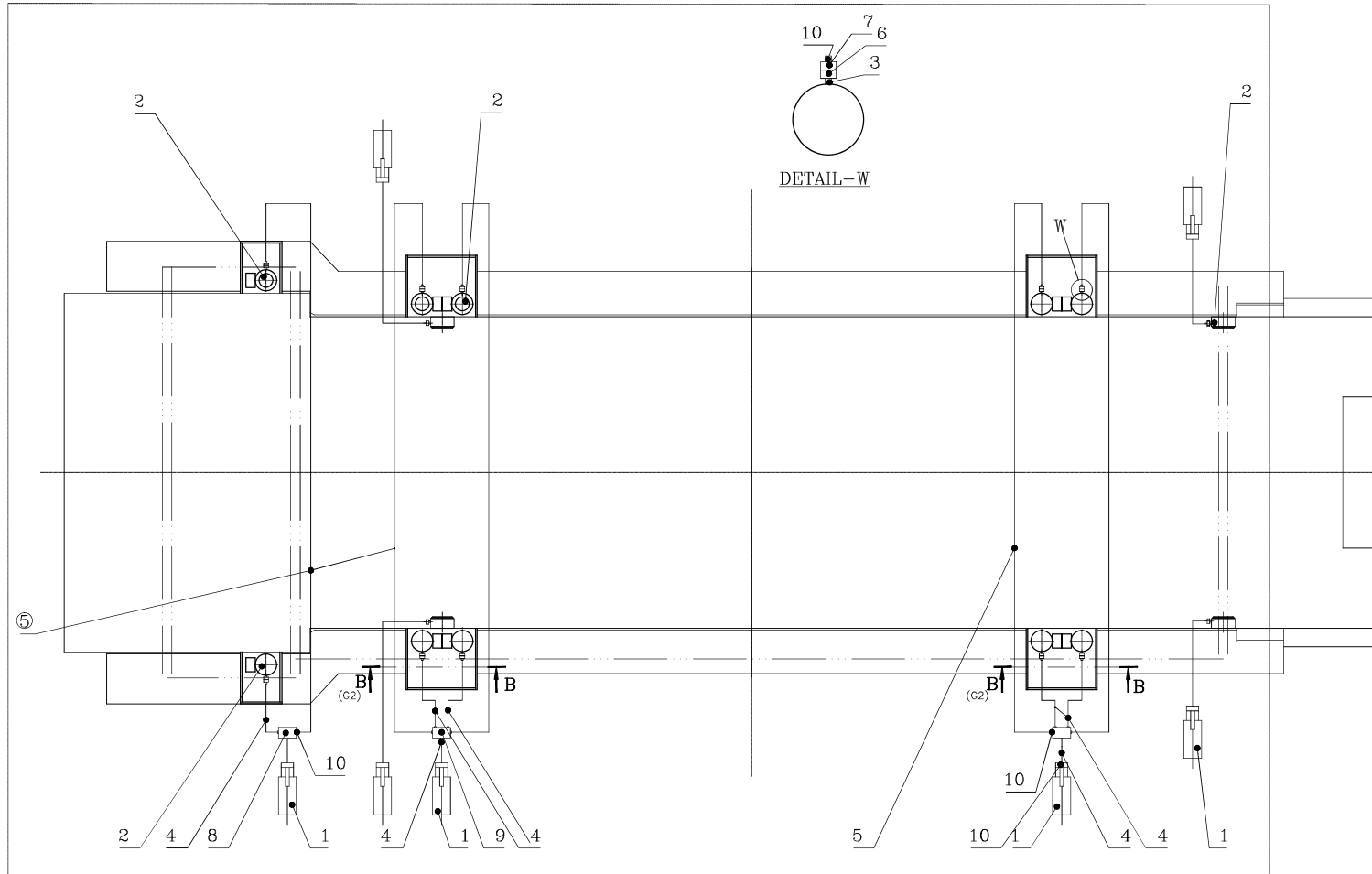
CROM NO. 01394501007		STATUS OF DRO		TYPE OF PRODUCT OR NAME OF CUSTOMER/ PROJECT		THDF 115/67	
GRADE OF UNTOL. DIM.:- M/CG- V/C/M/F AA 0230208 WELDING-A/B/C/D-AA621104 GAS CUTTING-T3AA0621101	APPROV E.M.T.	NAME J.E.M.T.NK	SIGN 30/01/21	DATE 30/01/21	Bharat Heavy Electricals Ltd. Hardwar		
REV. DATE 01 27.5.14	ALTERED CHECKED	AMISHRA DAMISHRA	RS/C RS/C	DEPT. TGE CODE 4133	SCALE NTS	WEIGHT(Kg.) 507	REF. TO ASSY. DRG. 01394501007 01
CHANGES DONE AS PER CHANGE ADVICE NO TGE-14-F0159				DRAWING NO. 11394501018		SHEET NO.2 NO.OF SHEETS 3	
HYDRAULIC UNIT ASSEMBLY				SIZE A1			

FIRST ANGLE PROJECTION (ALL DIMENSIONS ARE IN mm)

FORM: DG 45(B)

11394501018
DRAWING NO.

THE INFORMATION ON THIS DOCUMENT IS THE PROPERTY OF BHARAT HEAVY ELECTRICALS LIMITED.
IT MUST NOT BE USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE COMPANY.



SCHEMATIC DIAGRAM OF HYDRAULIC UNIT ASSEMBLY

PURCHASED

W90413902617

CROM NO. 01394501007		STATUS OF Dwg OR		TYPE OF PRODUCT THDF 115/67	
APPROVED	NAME	SIGN	DATE	NAME OF CUSTOMER/ PROJECT	
EMT		AEMTNR	28/01/11		
GRADE OF UNTOL. DIM.:—					
M/CG- V/C/M/F AA 0230208					
WELDING-A/B/C/D-AA621104					
GAS CUTTING-T3AA0621101					
REV	DATE	ALTERED	AMISHRA	RS/C	DEPT. TGE
01	27.5.14	CHECKED	AMISHRA	RS/C	CODE 4133
CHANGES DONE AS PER CHANGE ADVICE NO TGE-14-F0159				SCALE NTS	
				WEIGHT(Kg.) 507	
				REF. TO ASSY. DRG. 01394501007 01	
				DRAWING NO. 11394501018	
				SHEET NO.1 NO.OF SHEETS 3	
				TITLE HYDRAULIC UNIT ASSEMBLY	

SIZE A1

Pre-Qualification Requirements (Technical) for Hydraulic Unit Assembly

Introduction

Hydraulic Unit Assembly is to be used for alignment of large-size turbo-generator.

Mandatory Requirements


- 1.0 Vendor should have experience of supplying, in last ten years (from date of enquiry), at least 2 nos. of Hydraulic Unit Assembly (consisting of hydraulic pumps, hydraulic cylinders, seal rings, super pressure hoses, oil distributors, valve couplings, etc.) with capacity to handle 100 MT (minimum).

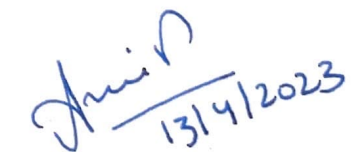
- 1.1 In support of above, vendor shall furnish their experience list along-with P.O. copies, as per the following format to BHEL:

Sl No	PO No.	Capacity (in Metric Tonnes)	Quantity	Name & address of customer	Date of supply

- 1.2 Vendor should furnish customer acceptance letter or material receipt of customer for at-least one P.O. listed above.
- 1.3 Vendor to furnish Test Certificates for at-least one P.O. listed above.
- 2.0 Vendor should confirm that they have in-house facilities for manufacture of above item. In case any activity is off-loaded to sub-vendor, details and manufacturing facilities of sub-vendor also to be furnished to BHEL.
- 3.0 Vendor should confirm that they have in-house testing facilities for carrying out hydraulic testing of the complete unit. In case it is off-loaded to sub-vendor, details and testing facilities of sub-vendor to be furnished to BHEL.
- 4.0 Vendor to confirm that the item shall be supplied as per BHEL drawing 11394501019.


13/04/23
Vaibhav Bansal
(DM/EME)


13/04/23
Pratibha Gupta
(Mgr/EME)


13/4/2023
Amit Mittal
(DGM/EME)

MANUFACTURER'S NAME AND ADDRESS			REFERENCE QUALITY PLAN					TO BE FILLED BY BHEL		TO BE FILLED BY BHEL				
BHEL	VENDOR'S NAME	ITEM	HYDRAULIC UNIT		QP NO.	QA_BI_QP_932, REV01								
				DATED	28.05.2024									
		DRG. NO.		11394501018										
		REV	01		Page 1 of 2									
SL. NO.	COMPONENT & OPERATIONS	CHARACTERISTICS		CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORDS		AGENCY			REMARKS
											M	B	N	
1	2	3		4	5	6	7	8	9	D	10			11

1.0	INCOMING MATERIAL/ BOUGHT OUT ITEMS												
1.1	HYDRAULIC PUMP	CHEMICAL & MECHANICAL PROPERTIES	MAJOR	CHEMICAL & MECHANICAL TESTING	ONE SAMPLE PER HEAT	APPROVED DRAWING/ DATASHEET	APPROVED DRAWING/ DATASHEET	TEST CERTIFICATE	√	P	V	-	
		HYDRAULIC TEST	MAJOR	HYDRAULIC	100%	APPROVED DRAWING/ DATASHEET	APPROVED DRAWING/ DATASHEET	TEST CERTIFICATE	√	P	V	-	
1.2	HYDRAULIC CYLINDER	CHEMICAL & MECHANICAL PROPERTIES	MAJOR	CHEMICAL & MECHANICAL TESTING	ONE SAMPLE PER HEAT	APPROVED DRAWING/ DATASHEET	APPROVED DRAWING/ DATASHEET	TEST CERTIFICATE	√	P	V	-	
		HYDRAULIC TEST	MAJOR	HYDRAULIC	100%	APPROVED DRAWING/ DATASHEET	APPROVED DRAWING/ DATASHEET	TEST CERTIFICATE	√	P	V	-	
1.3	SUPER PRESSURE HOSE	HYDRAULIC TEST	MAJOR	HYDRAULIC	100%	APPROVED DRAWING/ DATASHEET	APPROVED DRAWING/ DATASHEET	TEST CERTIFICATE	√	P	V	-	
1.4	VALVE COUPLING	HYDRAULIC TEST	MAJOR	HYDRAULIC	100%	APPROVED DRAWING/ DATASHEET	APPROVED DRAWING/ DATASHEET	TEST CERTIFICATE	√	P	V	-	
1.5	OIL DISTRIBUTOR/UNION	MAKE, VISUAL & HYDRAULIC TEST	MAJOR	VISUAL/ HYDRAULIC	100%	APPROVED DRAWING/ DATASHEET	APPROVED DRAWING/ DATASHEET	TEST CERTIFICATE	√	P	V	-	
2.0	FINAL INSPECTION & COMPLETE ASSEMBLY												
2.1	HYDRAULIC COMPLETE UNIT ASSEMBLY TEST	VISUAL & DIMENSION	MAJOR	PHYSICAL/MEASUREMENT	100%	APPROVED DRAWING/ DATASHEET	APPROVED DRAWING/ DATASHEET	INSPECTION REPORT	√	P	W	-	

		LEGEND:	FOR CUSTOMER USE	
MANUFACTURER/SUBCONTRACTOR		! RECORDS IDENTIFIED WITH 'TICK' SHALL BE ESSENTIALLY INCLUDED BY CONTRACTOR IN QA DOCUMENTATION. COC: CERTIFICATE OF COMPLIANCE M: MANUFACTURER / SUBCONTRACTOR B: BHEL / NOM. INSPECTION AGENCY N: CUSTOMER INDICATE 'P' PERFORM 'W' WITNESS AND 'V' VERIFICATION		APPROVED BY
		ALL 'W' INDICATED IN COLUMN 'N' SHALL BE 'CHP' OF CUSTOMER		

MANUFACTURER'S NAME AND ADDRESS			REFERENCE QUALITY PLAN					TO BE FILLED BY BHEL		TO BE FILLED BY BHEL				
BHEL	VENDOR'S NAME	ITEM	HYDRAULIC UNIT		QP NO.	QA_BI_QP_932, REV01								
				DATED	28.05.2024									
		DRG. NO.	11394501018											
		REV	01		Page 2 of 2									
SL. NO.	COMPONENT & OPERATIONS	CHARACTERISTICS		CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORDS		AGENCY			REMARKS
										M	B	N		
1	2	3		4	5	6	7	8	9	D	10			11
		FUNCTIONAL PERFORMANCE CHECK 100% RATED PRESSURE FOR 30 MINUTES		CRITICAL	HYDRAULIC	100%	APPROVED DRAWING/ DATASHEET	NO LEAKAGE & PRESSURE DROP	INSPECTION REPORT	√	P	W	-	
3.0	IDENTIFICATION, MARKING & PACKING													
3.1	PACKAGE	IDENTIFICATION		MAJOR	VISUAL	100%	APPROVED DRAWING/ DATASHEET	APPROVED DRAWING/ DATASHEET	INTERNAL RECORDS	√	P	V	-	
3.2	PACKAGE	PAINTING, PACKING		MAJOR	VISUAL & DFT	100%	APPROVED DRAWING/ DATASHEET	APPROVED DRAWING/ DATASHEET	TEST CERTIFICATE	√	P	V	-	

NOTES :-

1. TEST CERTIFICATES SHALL BE SUBMITTED BY THE VENDOR WITH CLEAR MARKING OF QP CLAUSE NUMBER AT THE TOP OF THE EACH PAGE. ALSO, TEST CERTIFICATES SHALL BE ARRANGED QP CLAUSE WISE. NO PAGES TO BE INCLUDED WITHOUT QP CLAUSE NUMBER IN TC DOSSIER.

		LEGEND: ! RECORDS IDENTIFIED WITH 'TICK' SHALL BE ESSENTIALLY INCLUDED BY CONTRACTOR IN QA DOCUMENTATION. COC: CERTIFICATE OF COMPLIANCE M: MANUFACTURER / SUBCONTRACTOR B: BHEL / NOM. INSPECTION AGENCY N: CUSTOMER INDICATE 'P' PERFORM 'W' WITNESS AND 'V' VERIFICATION	FOR CUSTOMER USE	
MANUFACTURER/SUBCONTRACTOR		ALL 'W' INDICATED IN COLUMN 'N' SHALL BE 'CHP' OF CUSTOMER		APPROVED BY