


दिनांक एवं हस्ताक्षर SIGN & DATE		उत्पाद मानक PRODUCT STANDARD	TG60427 मुख पृष्ठ PREFACE SHEET
सामग्री सूची संख्या को अधिकाधिक करता है SUPERSEDES INVENTORY NO.	<p align="center"> <u>TEMPERATURE CONTROL VALVE WITH MOTORISED ACTUATOR</u> केवल आंतरिक प्रयोग हेतु प्रदायक को देने से पूर्व इस मुखपृष्ठ को निकाल दें । FOR INTERNAL USE ONLY REMOVE THIS PREFACE BEFORE ISSUE TO SUPPLIERS. </p>		
COPYRIGHT AND CONFIDENTIAL The information on this documents is the property of Bharat Heavy Electrical Limited it must not be used directly or indirectly in any way detrimental to the interest of the company	<p>समतुल्य मानक/सूची आदि COMPARABLE STANDARDS / CATALOGUES ETC.</p> <p>सुझाए/सम्भावित प्रदायक एवं श्रेणी SUGGESTED / PROBABLE SUPPLIERS AND GRADES.</p> <p>AS PER APPROVED VENDOR LIST IN PMD.</p>		
स्वत्वाधिकार एवं गोपनीय इस प्रलेख में जो भी सूचना भारत हेतु इलेक्ट्रिकल्स की सम्पत्ति है इसका प्रत्यक्ष एवं अप्रत्यक्ष रूप से किसी भी तरह प्रयोग, जो कि कंपनी के हित में हानिकारक हो न किया जाए ।	<p>कोई अन्य जानकारी ANY OTHER INFORMATIONS</p>		
दिनांक एवं हस्ताक्षर SIGN & DATE 24/7/06			
सामग्री सूची संख्या INVENTORY NO. P-5807	रवीकृति APPROVED : AGM/CIE निर्माण PREPARED : CIE 27.01.07	जारी ISSUED : TSX 24.7.06	दिनांक : DATE :05.07.90 GR.No 3.40

Addendum for Specification no TG60427, Rev03.

A) For code no :- W90418113017, Cold Gas temp control valve+ actuator with integral starter :-

- 1) Valve shall be provided with integral starter without positioner
- 2) Maximum flow through temp control valve shall be 350 m³/hr.
- 3) Differential pressure across valve should not be more than 0.25kg/cm²
- 4) Pipe size shall be NB250 against cl no 4.0 with OD 273 & ID 262 (approx for 10" valve)
- 5) Input command will be 24VDC for opening /closing to the interposing relay mounted in integral starter of valve against cl no 5.2.1.iv.

B) For code no :- W90418113033, Cold Gas temp control valve+ + actuator with integral starter :-

- 1) Valve shall be provided with integral starter without positioner.
- 2) Maximum flow through temp control valve shall be 700 m³/hr.
- 3) Differential pressure across valve should not be more than 0.25kg/cm²
- 4) Minimum valve size should be all be decided by vendor to meet 2) & 3) points and shall not be less than 16" (with OD 406 & ID 390 for 16" valve)
- 5) Input command will be 24VDC for opening /closing to the interposing relay mounted in integral starter of valve against cl no 5.2.1.iv.

C) For code no :-W90418113041, Primary water temp control valve + actuator with integral starter :-

- 1) Valve shall be provided with integral starter without positioner.
- 2) Maximum flow through temp control valve shall be 200 m³/hr.
- 3) Differential pressure across valve should not be more than 0.25kg/cm²
- 4) Minimum valve size should be all be decided by vendor to meet 2) & 3) points and shall not be less than 8" (with OD 219 & ID 206 for 8" valve).
- 5) Input command will be 24VDC for opening /closing to the interposing relay mounted in integral starter of valve against cl no 5.2.1.iv.

Rest will be as per specification no TG60427, rev03.

Generated By:-


Satish Kumar


Satish
26/11/12


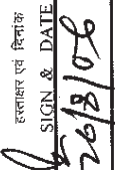


Approved By:-

KB Batra

KB
27/11/12

दिनांक एवं हस्ताक्षर SIGN & DATE		उत्पाद मानक (हीप - हार्डवयर) PRODUCT STANDARD (HEEP - HARDWAR)	TG60427 पृष्ठ का Page 2 of 8
SUPERSEDES INVENTORY NO. सामग्री सूची संख्या को अधिकारित करता है	(vii) Nominal temperature : 50°C (viii) Differential pressure to be throttled by valve : As per table (ix) Differential pressure shut – off : 3.0 Kg / cm ² (x) Cooling water quantity at : as per respective characteristic curves Various loads (xi) Weld end details : Butt weld as per ANSI-B 16.25		
COPYRIGHT AND CONFIDENTIAL The information on this documents is the property of Bharat Heavy Electrical Limited. It must not be used directly or indirectly, in any way, detrimental to the interest of the company.	5.1.2 Material of main parts :- (i) Body : Cast carbon steel to ASTM A 216/Grade WCC (ii) Bonnet : Cast carbon steel to ASTM A 216/Grade WCC (iii) Stem : 13% Chromium stainless steel as per ASTM A 182 F6a (iv) Seat : 13% Chromium stainless steel as per AISI 410 (v) Packing : Teflon Materials mentioned above indicate minimum requirements.		
स्वत्वाधिकार एवं गोपनीय इस प्रलेख में दी गई सूचना भारत हेवी इलेक्ट्रिकल्स की सम्पत्ति है इस्का प्रयोग एवं प्रसारण के बिना भारत हेवी इलेक्ट्रिकल्स के लिखित अनुमति के बिना न किया जाए।	5.2 ACTUATOR :- 5.2.1 Technical Data :- (i) Type : Motorised actuator with position indicator (ii) Movement : Linear / Rotary (iii) Power supply : 415V ± 10%, 50Hz, 3-Phase, 3-wire (Any other power supply needed will be generated by the vendor internally) (iv) Positioner input : 4-20 mA (for load burden up to 250 ohms) (v) Position transmitter output : 4-20 mA (for load burden > 250 ohms) (vi) Limit switch : 2 SPDT at each end position (vii) Torque switch : 2 SPDT for end positions (viii) Hand wheel : Side (ix) Operating time of actuator (Response time) : See table (x) Dead band : 0.1 – 3% of input signal (adjustable) (xi) Span adjustment : 0 – 100 % of signal (xii) Protection operation of valve : Stay put / Fully opened (configurable at site) (xiii) Motor Type / Duty : TEFC / Continuous (xiv) Standards to which motor conforms : IS 325 or equivalent BS/DIN/VDE/IEC stand (xv) Permissible voltage and frequency variation : ± 10 % of voltage, ± 5 % of frequency ± 10 % of combined voltage & frequency (xvi) Protection class : IP 54 or better (xvii) Ambient temperature : 55 °C (Maximum) (xviii) Relative humidity : 0 – 100 % (xix) Insulation class : F		
हस्ताक्षर एवं दिनांक SIGN & DATE P-5807	REV.NO. 03	निर्माणकर्ता WORKED BY SATISH KUMAR जांचकर्ता CHECKED BY M.R.BHARDWAJ	24/07/08 24/07/08

दिनांक एवं हस्ताक्षर SIGN & DATE		उत्पाद मानक (हीप - हार्डवयर) PRODUCT STANDARD (HEEP - HARDWAR)	TG60427 पृष्ठ का Page 3 of 8		
सामग्री सूची संख्या को अधिकृतित करता है SUPERSEDES INVENTORY NO.	<p>(xx) Voltage class : 660 V / 1100 V</p> <p>(xxi) Test voltage : 2 Kv (RMS) for 1 min.</p> <p>(xxii) Auxilary contacts rating : 5 AMP. At 220V(AC) / Silver Plated contacts</p> <p>(xxiii) Position Transmitter Characteristics : To be Suitable for 24 VDC, ± 20 %, 0.5 % resolution & ± 1 % accuracy</p> <p>5.2.2 actuator / position transmitter with complete technical characteristics will be offered.</p>				
COPYRIGHT AND CONFIDENTIAL The information on this documents is the property of Bharat Heavy Electrical Limited It must not be used directly or indirectly in any way detrimental to the interest of the company.	<p>6.0 TESTING AND INSPECTION :-</p> <p>6.1 The manufacturer shall conduct all tests required to ensure conformity of supplies to the requirements of this specification, applicable codes and standards.</p> <p>6.2 The bidder shall furnish quality plan on BHEL format for approval. The inspection shall be carried out at supplier's works before dispatch, as per BHEL approved Quality Plan.</p> <p>6.3 Minimum tests / checks of control valve to be included in the quality Plan :-</p> <p>6.3.1 Material tests of important parts for chemical and mechanical properties.</p> <p>6.3.2 Hydraulic test at 15 kg / cm² for 10 minutes.</p> <p>6.3.3 Seat leakage test at 10 Kg / cm² as per ANSI – B16.104</p> <p>6.3.4 Back seat test at 10 Kg / cm².</p> <p>6.4 Minimum tests / checks of Actuators to be included in Quality Plan :-</p> <p>6.4.1 Routine tests</p> <p>6.4.1.1 IR test</p> <p>6.4.1.2 HV test at 2 KV RMS for 1 minute</p> <p>6.4.1.3 Motor locked rotor test.</p> <p>6.4.1.4 Load current shall be measured at maximum rated torque of the actuator.</p> <p>6.4.1.5 Check for wiring for continuity and correctness.</p> <p>6.4.1.6 Check for correct operation of switches.</p> <p>6.4.2 Type tests :</p> <p>6.4.2.1 IR test</p> <p>6.4.2.2 HV test at 2 KV RMS for 1 minute</p> <p>6.4.2.3 Torque characteristics</p> <p>6.4.2.4 Functional test</p> <p>6.4.2.5 Response time test</p> <p>6.4.2.6 Repeatability test</p>				
स्वत्वाधिकार एवं गोपनीय इस प्रलेख में दी गई सूचना भारत हेवी इलेक्ट्रिकल्स की सम्पत्ति है इसका प्रत्यक्ष एवं अप्रत्यक्ष रूप से किसी भी तरह प्रयोग, जो कि कंपनी के हित में हानिकारक हो न किया जाए ।					
दिनांक SIGN & DATE 24/07/14					
सामग्री सूची संख्या INVENTORY NO. P-5807	REV.NO. 03		निर्माणकर्ता WORKED BY	SATISH KUMAR Satish 24/07/14	
			जांचकर्ता CHECKED BY	M.R.BHARDWAJ Lokesh 24/07/14	

दिनांक एवं हस्ताक्षर SIGN & DATE		उत्पाद मानक (डीप - हरिद्वार) PRODUCT STANDARD (HEEP - HARDWAR)	TG60427 पृष्ठ का Page 4 of 8			
सामग्री सूची संख्या को सुपरसेडिज INVENTORY NO.	<p>6.4.2.7 Supply variation : At a torque setting of maximum stated torque rating and supply voltage reduced to 80 %, the actuator shall be started when at nominal speed, the voltage shall be reduced to 75 % for 2 minutes and it shall be seen that no injurious heating of motor takes places.</p> <p>6.4.2.8 Over heating test : Over heating test shall be performed with the actuator running and the output shaft locked.</p> <p>6.4.2.9 Weather protection test 6.4.2.10 Endurance test.</p> <p>7.0 DOCUMENTS TO BE FURNISHED ALONGWITH OFFER IN TRIPLICATE :</p> <p>7.1 Technical data sheet (for 5.1 & 5.2 are meant for approval) of control valve , actuator and positioner.</p> <p>7.2 Electrical parameter of actuator motor including motor rating.</p> <p>7.3 General arrangement drawing of control valve with actuator and positioner.</p> <p>7.4 Dimensional detailed drawings alongwith material details of control valve , actuator and positioner.</p> <p>7.5 Detailed technical catalogues of valve , actuator and positioner.</p> <p>7.6 Quality Plan on BHEL format.</p> <p>7.7 Valve travel Vs Flow characteristics of the control valve (for reference).</p> <p>8.0 DOCUMENT TO BE FURNISHED AFTER PLACEMENT OF ORDER :-</p> <p>8.1 10 copies of operation and Maintenance manual of the valve , actuator and positioner per set.</p> <p>8.2 10 copies of GA drawing of the control valve assembly per set.</p> <p>8.3 5 copies each of test and Guarantee certificates.</p> <p>9.0 IDENTIFICATION :-</p> <p>Each control valve assembly shall have a stainless steel tag having engraved on it : Make , Type , Size , BHEL code No. , Application , Sl . No. , year of manufacture etc.</p> <p>10.0 PACKING AND CONSERVATION :-</p> <p>The control valve assembly shall be suitably conserved for long storage at site. These shall be adequately packed with enough cushioning material to avoid transit damages.</p>					
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स्वत्वाधिकार एवं गोपनीय इस प्रलेख में दी गई सूचना भारत की इलेक्ट्रिकल्स की सम्पत्ति है इसका प्रयोग एवं						
दिनांक SIGN & DATE	 26/8/06					
सामग्री सूची संख्या INVENTORY NO.	REV.NO. 03		निर्माणकर्ता WORKED BY	SATISH KUMAR		24/07/06
P-5807			जांचकर्ता CHECKED BY	M.R.BHARDWAJ		24/7/06

SUPERSEDES INVENTORY NO.
 सामग्री सूची संख्या को अधिकृत करता है

11.0 GUARANTEE :-

Equipment shall be guaranteed for a minimum period of 18 months from the date of supply or 12 months from the date of commissioning whichever is earlier.

12.0 LIST OF THE CROSS REFERED STANDARDS

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- 1.0 Butt Weld as per ANSI – B 16.25
- 2.0 Cast Carbon steel to ASTM A 216 / Grade WCC
- 3.0 13 % Chromium stainless steel as per ASTM A 182
- 4.0 13 % Chromium stainless steel as per AISI 410
- 5.0 Seat leakage test as per ANSI – B 16 – 104
- 6.0 IS : 325 OR Equivalent BS/DIN/VDE/IEC standards

Sl No.	Var. no.	material code	Applicable	Size (nb)	Nominal flow at rated load (m3/hr)	Applicable Figure.	Operati on time of actuator (sec)	remarks	ΔP* Kg/cm2
1.	00	-	PW controller	200	110	Fig. 1	50	For THW	0.20
2.	01	-	H2 controller	250	350	Fig.2	48	For THW	0.40
3.	02	W90418113017	H2 controller	250	300	Fig. 3	48	For THRI	0.25

स्वत्वाधिकार एवं गोपनीय
 इस दस्तावेज में दी गई सूचना भारत हेवी इलेक्ट्रिकल लिमिटेड की संपत्ति है इसका प्रत्यक्ष एवं

ΔP*-DIFFERENTIAL PRESSURE TO BE THROTTLED BY VALVE (MAX).

दिनांक एवं हस्ताक्षर
 SIGN & DATE
 28/8/06

सामग्री सूची संख्या INVENTORY NO. P-5807	REV.NO. 03		निर्माणकर्ता WORKED BY SATISH KUMAR	 24/07/06
			जांचकर्ता CHECKED BY M.R.BHARDWAJ	 24/7/06

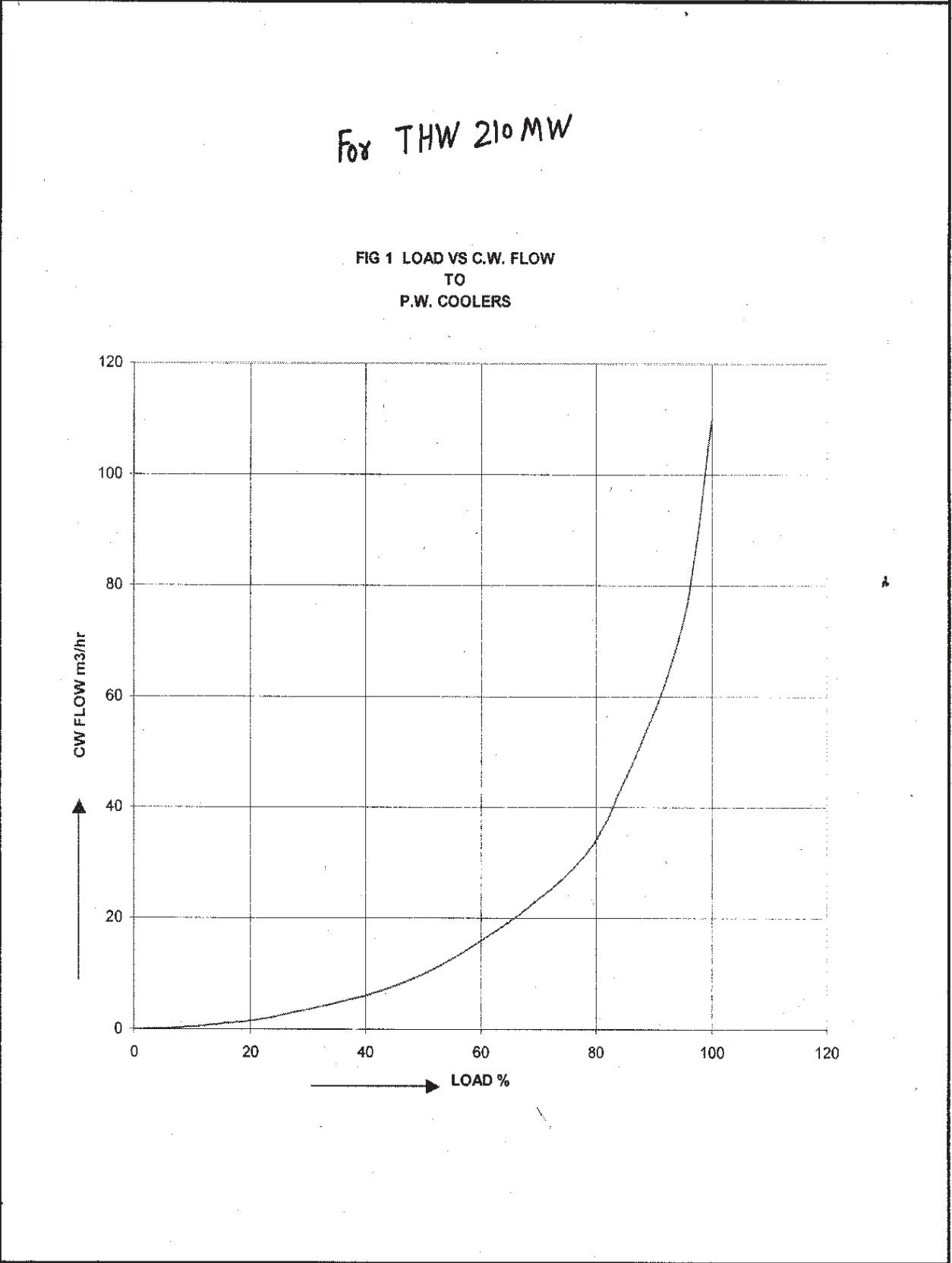
सामग्री सूची संख्या को अधिकारित करता है
SUPERSEDES INVENTORY NO.

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स्वत्वाधिकार एवं गोपनीय
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दिनांक एवं दिनांक
SIGN & DATE
26/12/08

सामग्री सूची संख्या
INVENTORY NO.
P-5807



REV.NO.
03

निर्माणकर्ता
WORKED BY
SATISH KUMAR

जांचकर्ता
CHECKED BY
M.R.BHARDWAJ

Satish 24/07/08

M.R.Bhardwaj 24/07/08

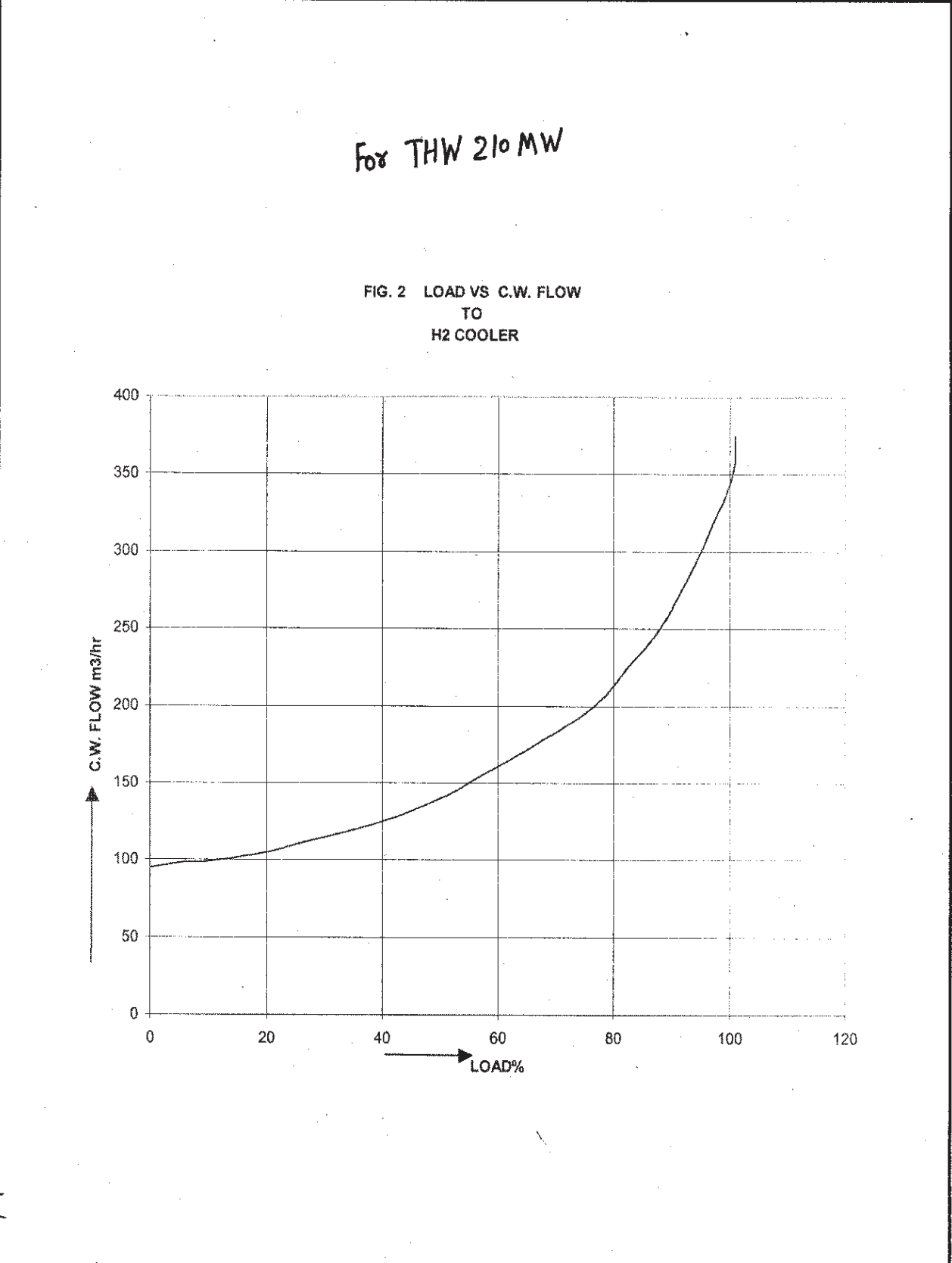
24/07/08



सामग्री सूची संख्या को अधिकृत किया है।
 SUPERSEDES INVENTORY NO.

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स्वत्वधिकार एवं गोपनीय
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दिनांक एवं हस्ताक्षर
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26/8/04



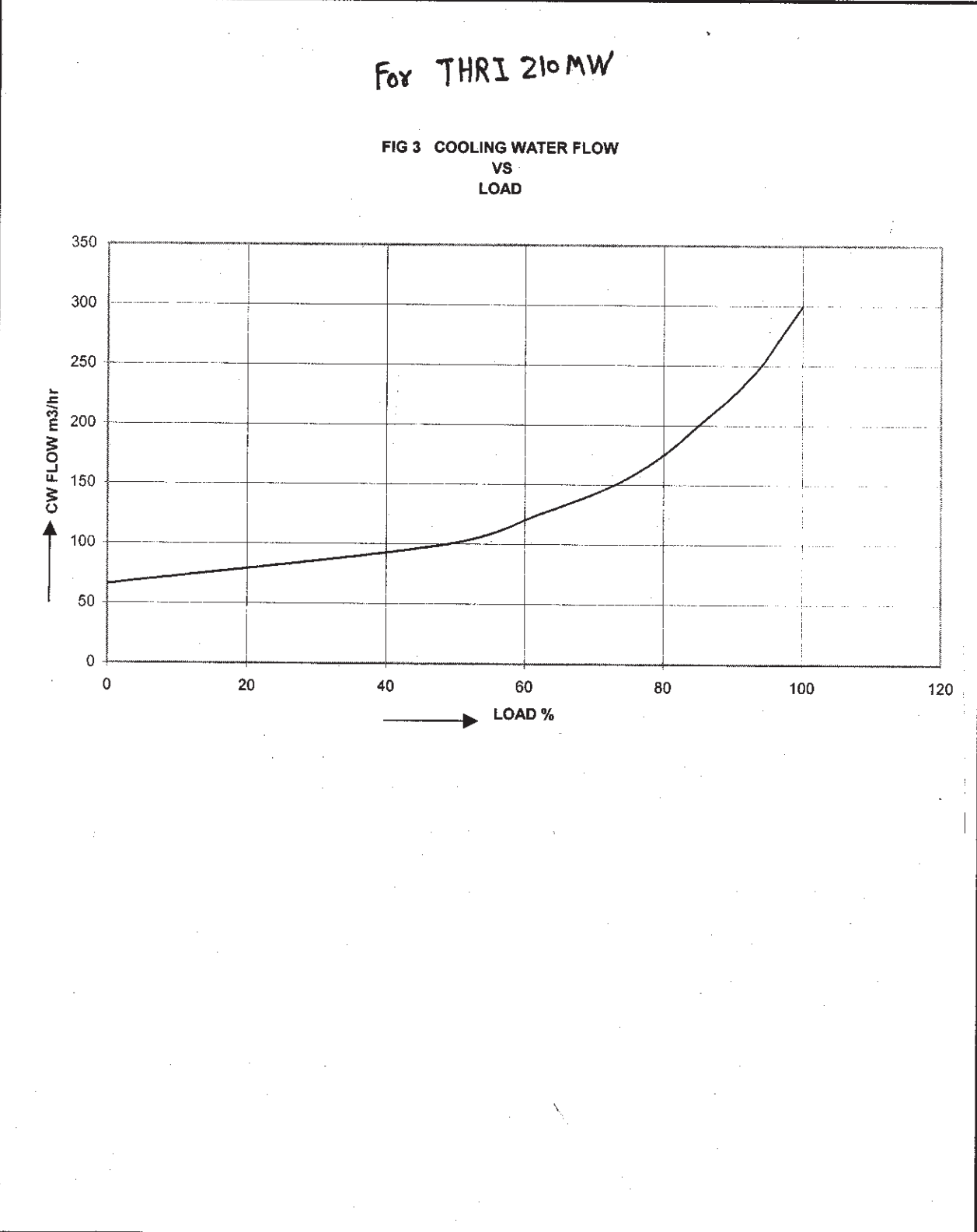
सामग्री सूची संख्या INVENTORY NO. P-5807	REV.NO. 03		निर्माणकर्ता WORKED BY SATISH KUMAR		24/07/04
			जांचकर्ता CHECKED BY M.R.BHARDWAJ		24/7/04



सामग्री सूची संख्या को
 अतिरिक्त करता है
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सामग्री सूची संख्या INVENTORY NO. P-5807	REV.NO. 03		निर्माणकर्ता WORKED BY SATISH KUMAR		24/07/06
			जांचकर्ता CHECKED BY M.R.BHARDWAJ		24/7/06

MANUFACTURER'S NAME AND ADDRESS		STANDARD QUALITY PLAN					TO BE FILLED BY BHEL			TO BE FILLED BY BHEL		
VENDOR'S NAME		ITEM	MOTORIZED TEMP. CONTROL VALVE	QP NO.	QA/B/QP/109							
BHEL		DRG. NO.	AS PER PO	REV.	01							
SL. NO.		CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORDS	AGENCY		REMARKS	
1		3	4	5	6	7	8	9	M	B	N	
		AS PER PO		Page 2 of 2								
		TG60427										
3.1.2		TORQUE CHARACTERISTICS FUNCTIONAL TEST RESPONSE TIME TEST REPEATABILITY TEST SUPPLY VARIATION TEST OVER HEATING TEST WEATHER PROTECTION TEST ENDURANCE TEST DIMENSIONS	MAJOR	TYPE TEST S	I PER MODUL	BHEL SPEC	BHEL SPEC/ IS325/ APPROVED DATA SHEET	TC	✓	P	V	
3.2		ASSEMBLY OF VALVE	MAJOR	MEASUREMENT	100%	DRG.	DRG.	TC	✓	P	W	
3.3		FUNCTIONAL TEST	MAJOR	OPERATION	100%	APPROVED DRG & DATA SHEET	APPROVED DRG & DATA SHEET	TC	✓	P	W	
3.4		SEAT LEAK TEST & BACK SEAT TEST	CRITICAL	LEAK TEST	100%	ORDERING SPEC. / BHEL APPD. DRG/ DATA SHEET	ORDERING SPEC. / BHEL APPD. DRG/ DATA SHEET	TC	✓	P	W	
3.5		PRESERVATION & PAINTING	MAJOR	VISUAL	100%	ORDERING SPEC. / BHEL APPD. DRG/ DATA SHEET	ORDERING SPEC. / BHEL APPD. DRG/ DATA SHEET	IR		P	-	

MANUFACTURER'S NAME AND ADDRESS		STANDARD QUALITY PLAN					TO BE FILLED BY BHEL			TO BE FILLED BY BHEL		
MANUFACTURER/SUBCONTRACTOR		LEGEND:					FOR CUSTOMER USE			APPROVED BY		
		! RECORDS IDENTIFIED WITH 'TICK' SHALL BE ESSENTIALLY INCLUDED BY CONTRACTOR IN QA DOCUMENTATION.								Sanjeev		
		M: MANUFACTURER / SUBCONTRACTOR B: BHEL / NOM. INSPECTION AGENCY N: CUSTOMER								23/09/14		
		INDICATE 'P' PERFORM 'W' WITNESS AND 'V' VERIFICATION ALL 'W' INDICATED IN COLUMN 'N' SHALL BE 'CHP' OF CUSTOMER								Sanjeev Kumar Bharadwaj अभिज्ञान/Engineer		
										गुणता आश्वासन/Quality Assurance बी. एच. ई. एल., हरिद्वार/BHEL Haridwar		