3PUMP

NON-UL TECHNICAL SUBMITTAL

ELECTRIC DRIVEN PUMP + DIESEL DRIVEN PUMP + JOCKEY PUMP

FLOW RATE (GPM)
1000

RATED PRESSURE(BAR)
10

NFPA

3PUMP

FIRE PUMP SUBMITTAL

Project Name:	
Client:	
Consultant:	
Contractor:	
Date:	
Revision:	

TECHNICAL DATA SHEET

3PUMP	Vendor Ref. No.	Doc. Seq. No. 01	Revision No. 0

PUMP CAPACITY: **FIRE PUMP 1000 GPM @ 10 BAR**

DATA SHEET

MAIN ELECTRIC PUMP - NFPA PERFORMANCE	
BRAND	3 PUMP
MODEL	3P 5×4-10.2L
CAPACITY	1000 GPM
HEAD	10 BAR
PUMP CASING	CAST IRON
IMPELLER	BRONZE
SHAFT	STAINLESS STEEL
SHAFT SEAL	MECH. SEAL
MOTOR / MODEL	INTEM / 280S-2
VOLTAGE	415V,50HZ, 3PH
POWER	**150 HP**
SPEED (RPM)	2960
INSULATION	CLASS F
PROTECTION	IP55

Standby DIESEL PUMP - NFPA PERFORMANCE	
BRAND	3 PUMP
MODEL	3P 5×4-10.2L
CAPACITY	1000 GPM
HEAD	10 BAR
PUMP CASING	CAST IRON
IMPELLER	BRONZE
SHAFT	STAINLESS STEEL
SHAFT SEAL	MECH. SEAL
MOTOR / MODEL	POWER / 6102BZQ
VOLTAGE	12V
POWER	**150 HP**
SPEED	3000 RPM

JOCKEY PUMP	
MODEL	**RV10-12 40GPM / 10.5BAR- 4.0KW - 50HZ**
IMPELLER / SHAFT	STAINLESS STEEL
PRESSURE SWITCH	PACIFIC
VALVES	ONTOR/GALA
CONTROLLERS	3 INDIVIDUAL CONTROLLERS- LS BRAND - MADE IN KOREA

FIRE PUMP SUBMITTAL

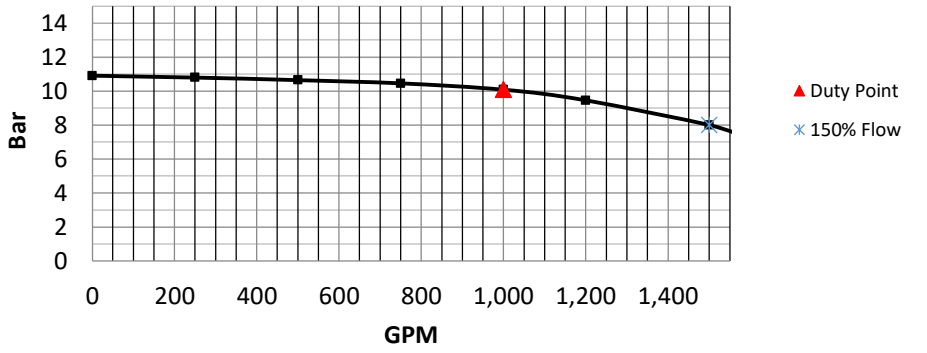
Project Name:	
Client:	
Consultant:	
Contractor:	
Date:	
Revision:	

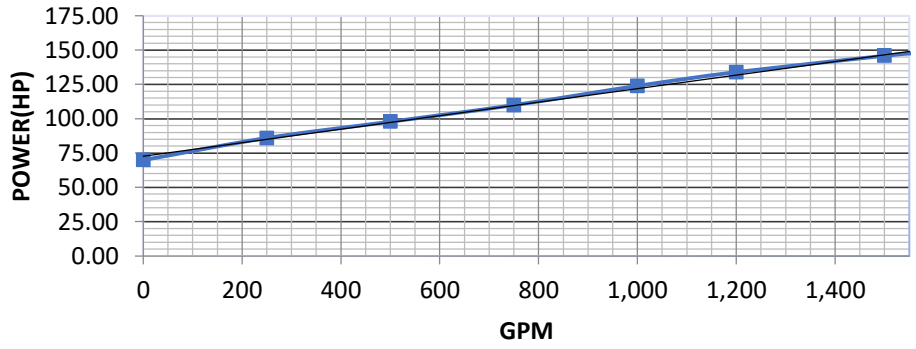
PERFORMANCE CURVE

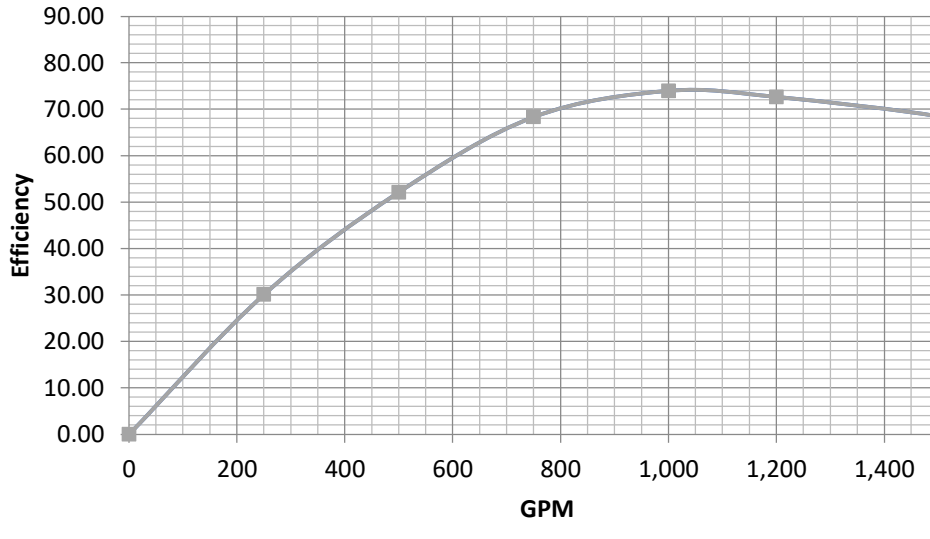
3 PUMP

Fire Pump Performance Curve

PUMP TYPE	END SUCTION	Sp. Gravity	1	-	RATED GPM	1000
MODEL NAME	3P 5×4-10.2L				RATED BAR	10
PUMP SPEED	2950 RPM					





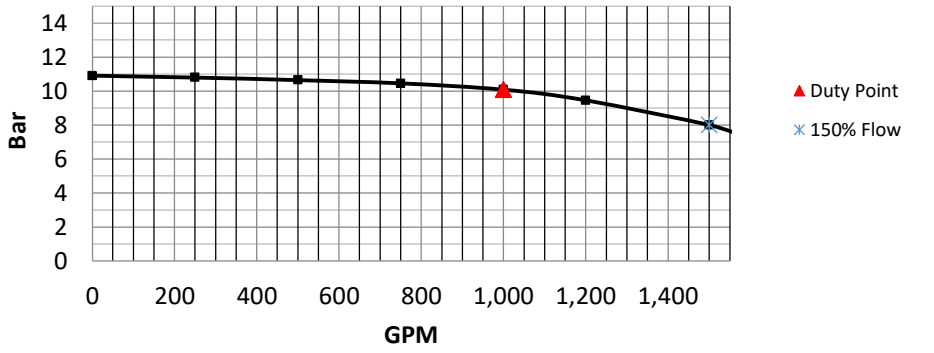


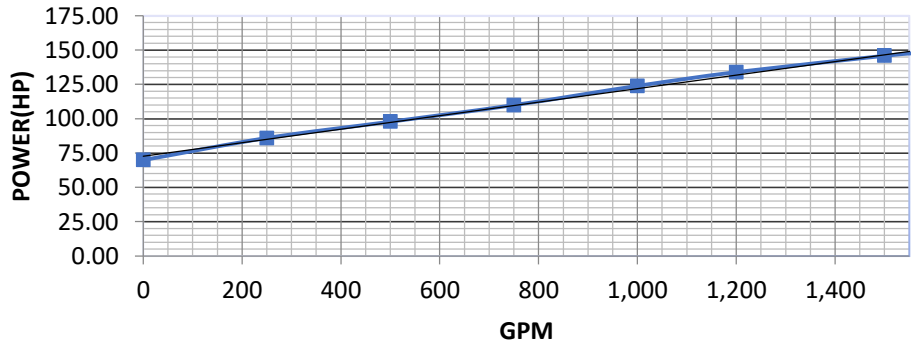
BAR@150 FLOW	8.00	PASS	BAR@SHUTOFF	10.90	PASS

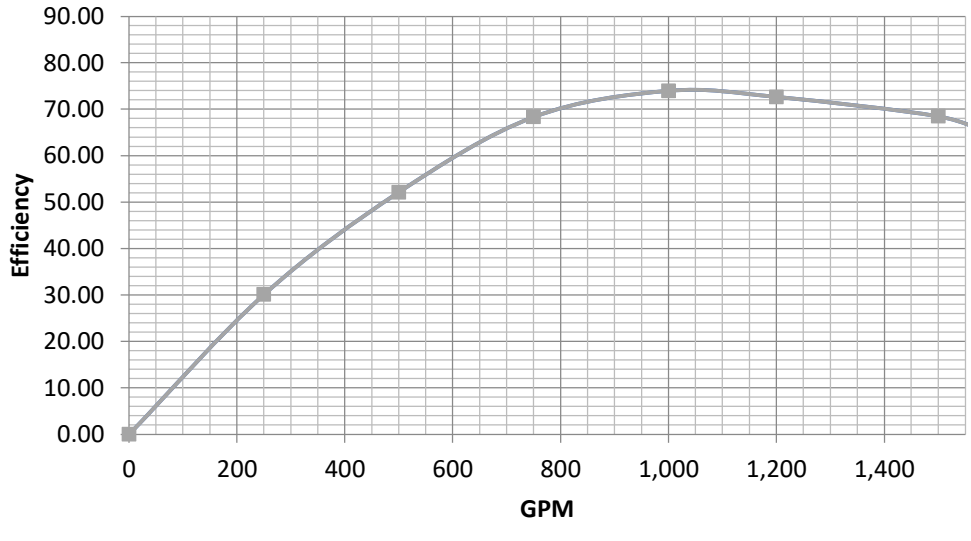
3 PUMP

Fire Pump Performance Curve

PUMP TYPE	END SUCTION	Sp. Gravity	1	-	RATED GPM	1000
MODEL NAME	3P 5×4-10.2L				RATED BAR	10
PUMP SPEED	3000 RPM					







BAR@150 FLOW	7.96	PASS	BAR@SHUTOFF	11.06	PASS

FIRE PUMP SUBMITTAL

Project Name:	
Client:	
Consultant:	
Contractor:	
Date:	
Revision:	

ELECTRIC MOTOR DATA SHEET

IE2 TYPE

INTEM MOTOR

Specification

Mechanical Design

Type: Squirrel Cage Induction Motor
Frame Size: 80M to 355C
Enclosure: Totally Enclosed Fan Cooled (TEFC)

Ingress Protection

Stock motors are design to meet Ingress Protection of IP55

Drive Method

Stock motors are design for both Direct Coupling and Belt Drive use

Bearings

High Quality Deep Groove Ball Sealed Bearings are use for our stock motor from frame size 80 to 225M and Vacuum De-Gassed High Quality Deep Groove Ball Open Bearings are use for stock motor from frame Size 250M to 355C. Any special bearings .

Lubrication

Both our sealed and open type bearing are grease lubricated.

Construction

Frame: High Grade Cast Iron
End Bracket: High Grade Cast Iron
External Fan: Polypropylene
Fan Cover: Pressed Steel
Shaft: Carbon Steel
Lead: 6 Leads
Iron Core: High Grade, Insulated, Cold Rolled, Electro-Magnetic Steel Plate

Terminal Box

Stock motor are fitted with pressed steel T-Box for Frame 80M to 180M and Cast Iron T-Box for frame 200L to 355M. T-Box are designed for provision of rotation by 90° to every direction that enable cable entry from 4 directions.

Finishing

Stock motor are completed with Phenolic Rust Proof Base Plus Lacquer Surface Finished Painting as standard

Lifting Device

All motor from Frame Size 90 and above comes with dual eye bolt for lifting purposes.

Standards

IEC 60072-1 Dimensions and output series for rotating electrical machines - Part 1: Frame numbers 56 to 400 and flange numbers 55 to 1080.

Connection Diagram

Direct-On-Line

For motor rating 2.2kW and below:
Low Voltage : 220~240V
High Voltage : 380~415V

For motor rating 3kW and above:
Low Voltage : 380~415

Star-Delta

Special Enhancement

The following enhancement are also available.

- IP 56
- Class 'H' Insulation
- Inverter Duty Wire
- Special Paint Finishes
- Special Shaft Extensions
- Dual Speed
- Smoke Spill Duty
- Stainless Steel Hardware
- Conversion of sealed bearing to open bearing

Optional Accessories

Thermal Protection Accessories

Thermistors
Resistance Temperature Detectors (RTD)
Thermostat

Moisture Protection Accessories

Space Heater

IE2 Performance Data (2 Pole)

OUTPUT		FULL LOAD	FRAME SIZE	EFFICIENCY			POWER FACTOR			CURRENT				TORQUE					APPROX WEIGHT
				FULL LOAD	3/4 LOAD	1/2 LOAD	FULL LOAD	3/4 LOAD	1/2 LOAD	FULL LOAD (A) VOLTAGE			LRC (A)	FULL LOAD	LOCKED ROTOR	PULL UP	BREAK DOWN	ROTOR GD²	
kW	HP	rpm		(%)	(%)	(%)	(%)	(%)	(%)	380	400	415	400V	kg-m	%FLT	%FLT	%FLT	kg-m²	kg
0.75	1	2800	80M	72.1	71.6	68.8	88.0	81.0	68.0	1.80	1.71	1.64	11	0.261	235	210	255	0.005	16.5
1.1	1.5	2810	80M	75.0	75.9	74.5	87.5	81.0	70.0	2.55	2.42	2.33	17	0.381	265	235	290	0.006	18.0
1.5	2	2850	90S	77.2	77.2	75.3	88.0	82.0	70.5	3.35	3.19	3.07	21	0.512	225	210	290	0.010	23.0
2.2	3	2855	90L	79.7	80.7	79.7	89.0	84.0	74.0	4.71	4.48	4.31	33	0.750	240	230	310	0.013	27.0
3	4	2890	100L	81.5	82.0	80.5	89.0	85.0	76.0	6.28	5.97	5.75	50	1.010	215	195	280	0.022	37.5
3.7	5	2880	112M	82.6	83.6	81.6	90.0	87.0	79.0	7.56	7.18	6.92	62	1.250	240	180	320	0.042	47.5
4	5.5	2910	112M	83.1	84.1	83.1	90.5	87.5	79.5	8.08	7.68	7.40	67	1.337	200	170	325	0.042	47.5
5.5	7.5	2900	132S	84.7	83.7	81.3	88.0	85.5	79.0	11.2	10.7	10.3	69	1.845	170	150	235	0.057	61.0
7.5	10	2895	132S	86.0	86.0	84.5	82.0	80.0	76.0	16.2	15.4	14.8	91	2.521	170	145	225	0.063	65.0
11	15	2945	160M1-2	87.6	87.6	85.6	89.0	85.5	77.5	21.4	20.4	19.6	176	3.634	225	140	280	0.154	105
15	20	2940	160M2-2	88.7	89.2	88.2	91.0	90.0	85.5	28.2	26.8	25.9	210	4.964	220	135	260	0.192	120
18.5	25	2940	160L-2	89.3	89.8	89.3	92.0	90.0	85.5	34.2	32.5	31.3	291	6.123	270	190	310	0.237	135
22	30	2945	180M-2	89.9	89.9	88.9	90.0	88.0	83.5	41.3	39.2	37.8	314	7.269	220	175	280	0.283	175
30	40	2955	180M-2	90.7	90.2	87.7	84.5	79.0	71.0	59.5	56.5	54.5	441	9.878	185	140	275	0.521	240
37	50	2945	200L2-2	91.2	91.2	90.2	88.5	87.0	81.0	69.6	66.2	63.8	527	12.18	195	135	270	0.633	270
45	60	2950	200L-2	91.7	91.2	89.7	91.5	90.0	86.0	81.5	77.4	74.6	600	14.82	150	130	260	1.074	315
55	75	2970	225M-2	92.1	92.1	91.1	91.0	90.0	85.5	99.7	94.7	91.3	697	18.02	135	115	295	1.211	405
75	100	2960	250S-2	92.7	92.7	91.4	87.0	85.0	80.0	141	134	129	966	24.57	130	120	260	1.759	515
90	125	2960	250M-2	93.0	92.8	91.9	87.0	84.0	76.5	169	161	155	1157	29.53	140	120	290	2.023	552
110	150	2960	280S-2	93.5	93.5	92.8	89.0	87.0	81.0	201	191	184	1330	36.09	135	115	230	3.600	800
132	175	2970	315MA	93.7	93.7	93.0	89.5	88.5	83.5	239	227	219	1570	43.31	145	120	230	4.400	900
150	200	2970	280M-2	94.0	94.0	93.2	91.5	90.5	86.0	283	269	259	2050	52.50	210	175	240	5.200	950
160	215	2970	315LA	94.0	94.0	93.2	91.5	90.5	86.0	283	269	259	2050	52.50	210	175	240	5.200	980
200	270	2970	315LA	94.0	94.0	93.4	92.0	91.0	87.5	351	334	322	2500	65.62	210	175	240	6.400	1100
(220)	(300)	2970	315CA	94.4	94.0	92.8	90.5	89.0	83.5	391	372	358	2800	72.18	150	125	270	7.200	1380
220	300	2975	355MA	94.5	94.0	93.0	90.0	88.0	81.0	393	373	360	2840	72.06	140	115	280	10.40	1550
(250)	(335)	2972	315CA	94.6	94.1	93.0	92.0	91.0	87.5	436	415	400	3100	81.97	150	125	270	8.400	1500
250	335	2978	355MA	94.6	94.2	93.3	91.0	89.0	83.5	441	419	404	3180	81.81	150	125	280	12.00	1650
(315)	(420)	2975	315DA	94.8	94.4	93.5	92.5	91.5	88.0	546	518	500	3900	103.2	160	130	280	10.40	1720
315	420	2978	355LA	94.8	94.4	93.5	91.5	90.0	86.0	552	524	505	3900	103.1	150	125	280	14.00	1900
375	500	2980	355CA	94.8	94.8	93.7	92.0	90.5	86.5	653	621	598	4500	122.6	150	125	280	12.40	2340

Note:

1. The above are typical values based on test according to IEC 60045-2-1:2007. (DY)
2. Tolerance according to IEC 60034-1.
3. Breakdown & Locked rotor torques are show as average expected voltages
4. Efficiency, power factor, speed and torque are the same for other voltages.
   Current values vary inversely with voltage
5. Output in () is for Optional Frame size upon request
6. Frame size 315C, 315D & 355C: only suitable for IM B3 and IM B5
7. Noise according to IEC 60034-9.
8. Data subject to change without prior notice.

IE2 Performance Data (4 Pole)

OUTPUT		FULL LOAD	FRAME SIZE	EFFICIENCY			POWER FACTOR			CURRENT				TORQUE					APPROX WEIGHT
				FULL LOAD	3/4 LOAD	1/2 LOAD	FULL LOAD	3/4 LOAD	1/2 LOAD	FULL LOAD (A)			LRC	FULL LOAD	LOCKE ROTOR	PULL UP	BREAK DOWN	ROTOR GD^2	
										VOLTAGE			(A)						
kW	HP	rpm		(%)	(%)	(%)	(%)	(%)	(%)	380	400	415	400V	kg-m	%FLT	%FLT	%FLT	kg-m^2	kg
0.55	0.75	1425	80M	70.0	68.9	62.1	73.0	62.5	50.0	1.64	1.55	1.50	9.0	0.376	220	200	265	0.007	15.0
0.75	1	1425	80M	72.1	71.6	68.3	77.0	66.0	52.5	2.05	1.95	1.88	12	0.512	240	215	275	0.009	16.5
1.1	1.5	1425	90S	75.0	75.0	68.1	79.0	68.5	55.5	2.82	2.68	2.58	17	0.751	220	165	235	0.014	22.0
1.5	2	1425	90L	77.2	77.2	74.2	81.0	72.5	59.0	3.64	3.46	3.34	23	1.024	230	175	240	0.017	24.0
2.2	3	1435	100L	79.7	79.7	77.2	79.5	71.0	57.0	5.28	5.01	4.83	39	1.492	210	185	300	0.033	32.0
3	4	1445	100L	81.5	80.9	77.5	85.0	76.0	63.0	6.58	6.25	6.02	52	2.020	250	180	300	0.046	37.5
3.7	5	1445	112M	82.6	82.6	80.6	82.0	74.5	64.0	8.30	7.88	7.60	62	2.491	220	180	290	0.059	44.5
4	5.5	1445	112M	83.1	83.6	81.7	82.0	76.0	64.0	8.92	8.47	8.17	60	2.693	190	180	260	0.065	47.5
5.5	7.5	1465	132S	84.7	84.7	83.2	82.5	75.5	63.5	12.0	11.4	11.0	86	3.653	235	190	315	0.103	64.0
7.5	10	1460	132M	86.0	86.5	85.0	86.0	81.5	71.5	15.4	14.6	14.1	109	4.998	215	175	295	0.133	78.0
11	15	1465	160M	87.6	88.1	87.1	86.5	82.5	74.5	22.1	21.0	20.2	155	7.306	200	150	255	0.271	105
15	20	1465	160L	88.7	88.7	87.2	86.0	80.5	71.0	29.9	28.4	27.4	217	9.962	215	155	265	0.396	130
18.5	25	1475	180M	89.3	89.3	88.8	86.0	83.5	76.5	36.6	34.8	33.5	220	12.20	165	125	220	0.611	175
22	30	1475	180L	89.9	89.9	88.9	84.0	80.5	72.5	44.3	42.0	40.5	299	14.51	195	150	230	0.712	190
30	40	1475	200L	90.7	91.2	90.7	86.5	83.5	76.5	58.1	55.2	53.2	444	19.79	240	185	275	1.220	255
37	50	1480	225SC	91.2	90.7	89.7	85.0	81.5	74.5	72.5	68.9	66.4	489	24.33	190	160	245	1.649	315
45	60	1475	225MC	91.7	92.2	91.2	85.5	83.0	76.5	87.2	82.8	79.8	523	29.68	175	145	220	1.731	330
55	75	1485	250MC	92.1	92.1	91.1	87.0	85.0	79.5	104	99.1	95.5	714	36.04	220	110	230	2.755	450
75	100	1480	280SB	92.7	92.7	92.2	84.5	81.0	73.5	145	138	133	948	49.31	175	165	275	4.224	566
90	125	1480	280MB	93.0	93.2	92.5	85.5	82.5	72.5	172	163	157	1164	59.17	175	165	270	4.943	624
110	150	1480	315SB	93.5	93.5	92.9	86.5	83.5	75.5	207	196	189	1330	72.43	190	155	250	7.200	800
132	175	1480	315MB	93.7	93.7	93.2	86.5	83.0	74.5	247	235	227	1570	86.91	200	165	250	8.400	900
(160)	(215)	1482	315MB	94.0	94.0	93.4	87.5	84.5	77.0	296	281	271	2000	105.2	200	165	250	10.00	960
160	215	1482	315LB	94.0	94.0	93.4	87.5	84.5	77.0	296	281	271	2000	105.2	200	165	250	10.00	990
200	270	1482	315LB	94.0	94.1	93.6	88.5	86.0	79.0	365	347	334	2500	131.5	210	175	250	13.20	1160
(220)	(300)	1484	315CB	94.5	94.5	93.7	89.5	88.0	82.5	395	375	362	2840	144.5	200	165	250	19.20	1420
220	300	1486	355MB	94.5	94.3	93.4	87.8	85.0	78.4	403	383	369	2750	144.3	180	160	250	20.40	1550
(250)	(335)	1485	315CB	94.6	94.5	93.8	89.5	87.5	82.0	449	426	411	3150	164.1	200	165	260	21.20	1500
250	335	1486	355MB	94.6	94.4	93.8	88.0	85.5	78.0	456	433	418	3150	163.9	190	155	270	23.20	1650
(315)	(420)	1485	315DB	94.9	94.9	94.4	90.0	88.0	82.5	560	532	513	4100	206.7	200	165	260	26.40	1780
315	420	1486	355LB	94.9	94.8	94.3	88.8	86.3	79.5	568	540	520	3900	206.6	200	165	270	28.80	1900
375	500	1486	355CB	94.9	94.9	94.4	89.5	88.0	82.0	671	637	614	4500	245.9	200	165	270	34.80	2340

Note:

1. The above are typical values based on test according to IEC 60045-2-1:2007. (DY)
2. Tolerance according to IEC 60034-1.
3. Breakdown & Locked rotor torques are show as average expected voltages
4. Efficiency, power factor, speed and torque are the same for other voltages.
   Current values vary inversely with voltage
5. Output in () is for Optional Frame size upon request
6. Frame size 315C, 315D & 355C: only suitable for IM B3 and IM B5
7. Noise according to IEC 60034-9.
8. Data subject to change without prior notice.

Dimensions

B3 Outline Dimension

Foot Mounted(B3)

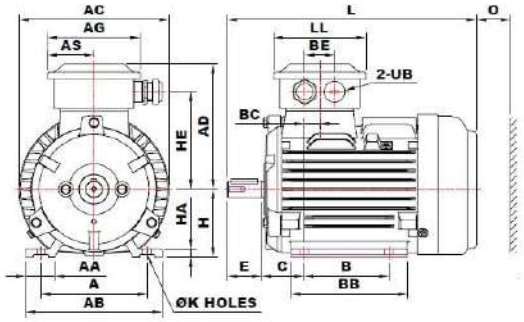


FIG. 1

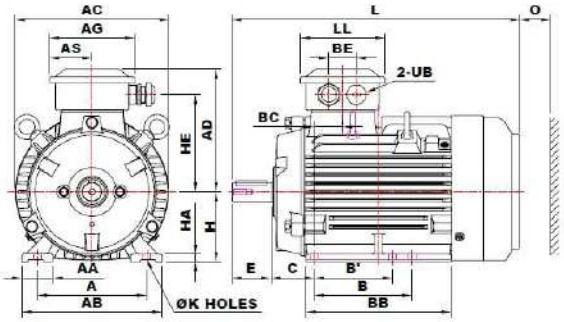
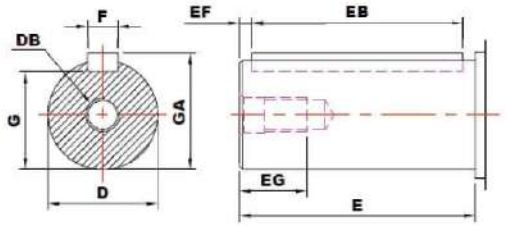


FIG. 2



Output (kW)				FRAME SIZE	FIG. NO	A	AA	AB	AC	AD	AG	AS	B	B'	BA	BA'	BB	BC	BE	C
2P	4P	6P	8P																	
0.75 1.1	0.55 0.75	0.55	0.18	80M	1	125	34.5	161	177	148	109	54.5	100	---	---	---	137	18.5	35	50
1.5	1.1	0.75	0.37	90S	2	140	40	180	197	158	109	54.5	100	---	---	---	161	36	35	56
2.2	1.5	1.1	0.55	90L		140	40	180	197	158	109	54.5	125	100	---	---	186	36	35	56
3	2.2 3	1.5	0.75 1.1	100L		160	40	200	219	185.5	125	62.5	140	---	---	---	181	21	40	63
3.7 4	3.7 4	2.2	1.5	112M		190	45	235	235	193	125	62.5	140	---	---	---	186	28	40	70
5.5 7.5	5.5	3	2.2	132S		216	57	263	273	210.5	125	62.5	140	---	---	---	184	6	40	89
---	7.5	3.7 4 5.5	3	132M		216	57	263	273	210.5	125	62.5	178	140	---	---	222	6	40	89
11 15	11	7.5	3.7 4 5.5	160M	3	254	60	300	317	240.5	166	83	210	---	57.5	57.5	256	47	60	108
18.5	15	11	7.5	160L		254	60	300	317	240.5	166	83	254	210	57.5	101.5	300	47	60	108
22	18.5	---	---	180M		279	65	330	354	266.5	166	83	241	---	62	62	292	39	60	121
---	22	15	11	180L		279	65	330	354	266.5	166	83	279	241	62	100	330	39	60	121
30 37	30	18.5 22	15	200L	4	318	70	378	398	332	231	110.5	305	---	76	76	365	60	106	133
---	37	---	18.5	225SC		356	75	431	449	358	231	110.5	286	---	90	90	350	37.5	106	149
45	---	---	---	225MA		356	75	431	449	358	231	110.5	311	286	90	115	375	37.5	106	149
---	45	30	22	225MC		356	75	431	449	358	231	110.5	311	286	90	115	375	37.5	106	149

Note:

1. All dimensions are in mm.
2. Pre-packed shielded ball bearing for frame size 80M to 225M
3. Dual Eye-bolts provided for frame 90S to 355C
4. Data are subject to change without prior notice

B3 Outline Dimension

Foot Mounted(B3)

Frame Size: 80M to 225M

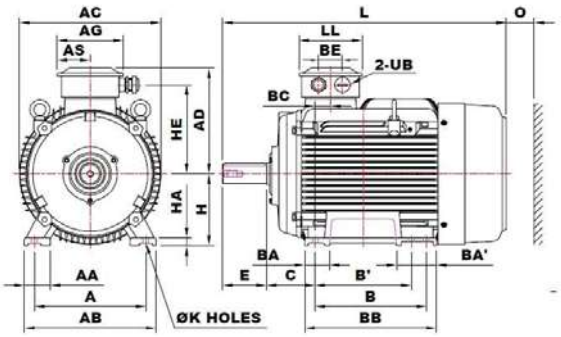


FIG. 3

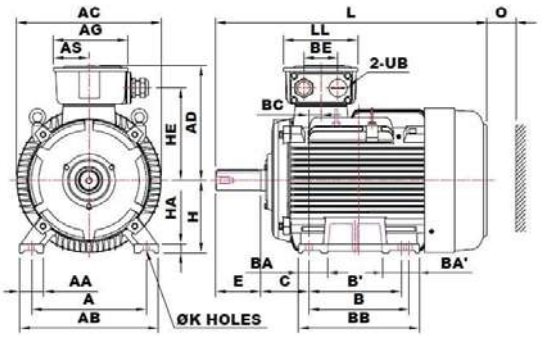
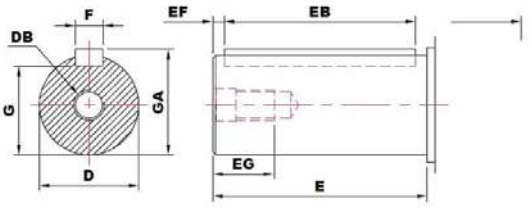


FIG. 4



FRAME SIZE	H	HA	HE	K	L	LL	O	UB	SHAFT EXTENSION									BEARING	
									D	E	EB	EF	EG	F	G	GA	DB	DRIVE END	OPPOSITE DRIVE END
80M	80	10	115	10	293	109	40	M20x1.5	19	40	32	4	16	6	15.5	21.5	M6	6204ZZC3	6204ZZC3
90S	90	10	125	10	344.5	109	40	M20x1.5	24	50	40	5	19	8	20	27	M8	6205ZZC3	6205ZZC3
90L	90	10	125	10	369.5	109	40	M20x1.5	24	50	40	5	19	8	20	27	M8		
100L	100	12	146	12	392	125	50	M25X1.5	28	60	50	5	22	8	24	31	M10	6206ZZC3	6206ZZC3
112M	112	13	153.5	12	412.5	125	50	M25X1.5	28	60	50	5	22	8	24	31	M10	6306ZZC3	6306ZZC3
132S	132	16	171	12	466	125	50	M25x1.5	38	80	70	5	28	10	33	41	M12	6308ZZC3	6306ZZC3
132M	132	16	171	12	504	125	50	M25x1.5	38	80	70	5	28	10	33	41	M12		
160M	160	18	198	14.5	608	158	60	M32x1.5	42	110	100	5	36	12	37	45	M16	6309ZZC3	6307ZZC3
160L	160	18	198	14.5	652	158	60	M32x1.5	42	110	100	5	36	12	37	45	M16		
180M	180	20	224	14.5	672	158	70	M32x1.5	48	110	100	5	36	14	42.5	51.5	M16	6311ZZC3	6310ZZC3
180L	180	20	224	14.5	710	158	70	M32x1.5	48	110	100	5	36	14	42.5	51.5	M16		
200L	200	24	262	18.5	770	231	80	M50x1.5	55	110	100	5	42	16	49	59	M20	6312ZZC3	6212ZZC3
225SC	225	28	288	18.5	816	231	90	M50x1.5	60	140	125	7.5	42	18	53	64	M20	6313ZZC3	6213ZZC3
225MA	225	28	288	18.5	811	231	90	M50x1.5	55	110	100	5	42	16	49	59	M20	6312ZZC3	6212ZZC3
225MC	225	28	288	18.5	841	231	90	M50x1.5	60	140	125	7.5	42	18	53	64	M20	6313ZZC3	6213ZZC3

Note:

1. All dimensions are in mm.
2. Tolerance of shaft end diameter D: 1) Ø19~Ø28:j6, 2) Ø38~Ø48:k6, 3) Ø55~Ø65:m6
3. Tolerance of shaft center high H : +0, -0.5
4. Data are subject to change without prior notice

Dimensions

B3 Outline Dimension

Foot Mounted(B3)
Frame Size: 250 M to 355C

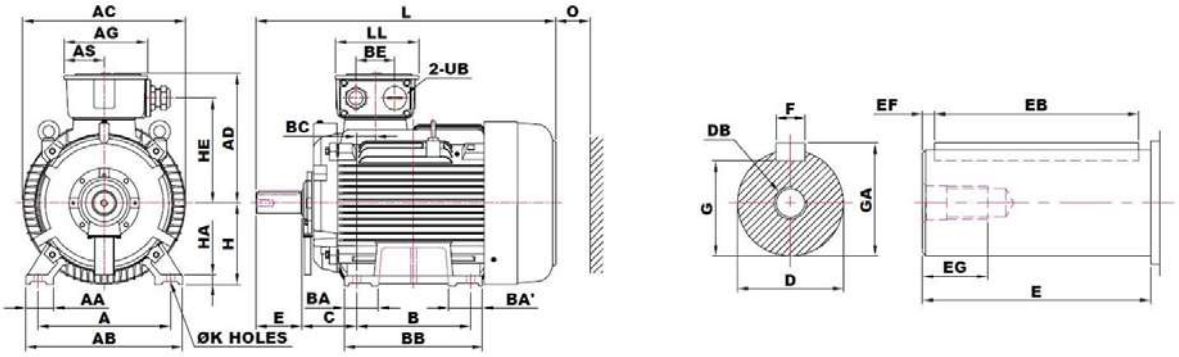


FIG. 5

Output (kW)				FRAME SIZE	FIG. NO	A	AA	AB	AC	AD	AG	AS	B	B'	BA	BA'	BB	BC	BE	C
2P	4P	6P	8P																	
55	---	---	---	250MA	5	406	85	480	499	400	255	122.5	349	---	105	105	425	57.5	119	168
---	55	37	30	250MC		406	85	480	499	400	255	122.5	349	---	105	105	425	57.5	119	168
75	---	---	---	280SA	6	457	110	560	546	433	255	122.5	368	---	110	110	445	48	119	190
---	75	45	37	280SB		457	110	560	546	433	255	122.5	368	---	110	110	445	48	119	190
90	---	---	---	280MA		457	110	560	546	433	255	122.5	419	---	130	137	495	48	119	190
---	90	55	45	280MB		457	110	560	546	433	255	122.5	419	---	130	137	495	48	119	190
110	---	---	---	315SA		508	115	615	620	527.5	336	163	406	---	210	210	620	53	140	216
---	110	75	55	315SB		508	115	615	620	527.5	336	163	406	---	210	210	620	53	140	216
132 (160)	---	---	---	315MA		508	115	615	620	527.5	336	163	457	---	240	240	670	53	140	216
---	132 (160)	90 (110)	75	315MB		508	115	615	620	527.5	336	163	457	---	240	240	670	53	140	216
160 200	---	---	---	315LA		508	130	630	620	527.5	336	163	508	---	230	230	770	53	140	216
---	160 200	110 132 (160)	90 110	315LB		508	130	630	620	527.5	336	163	508	---	230	230	770	53	140	216
(220) (250)	---	---	---	315CA		508	150	650	682	590	412	189	710	---	335	335	900	68	180	216
---	(220) (250)	(200) (220)	(132) (160)	315CB		508	150	650	682	590	412	189	710	---	335	335	900	68	180	216
(315)	---	---	---	315DA		508	150	650	682	590	412	189	900	---	180	250	1060	68	180	216
---	(315)	(250)	(200) (220)	315DB		508	150	650	682	590	412	189	900	---	180	250	1060	68	180	216
220 250	---	---	---	355MA		610	150	750	810	645	412	189	---	560	330	330	910	48	180	254
---	220 250	160 200 220	132 160	355MB		610	150	750	810	645	412	189	---	560	330	330	910	48	180	254
315	---	---	---	355LA		610	150	750	810	645	412	189	630	---	330	330	910	48	180	254
---	315	250	200 220	355LB		610	150	750	810	645	412	189	630	---	330	330	910	48	180	254
375	---	---	---	355CA		610	150	750	810	645	412	189	710	---	390	390	1100	48	180	254
---	375	315	250	355CB		610	150	750	810	645	412	189	710	---	390	390	1100	48	180	254

Note:

1. All dimensions are in mm.
2. Open type ball bearing for frame size 250M to 355C
3. Dual Eye-bolts provided for frame 90S to 355C
4. Output in ( ) is for optional frame size upon request
5. Data are subject to change without prior notice

B3 Outline Dimension

Foot Mounted(B3)
Frame Size: 250M to 355C

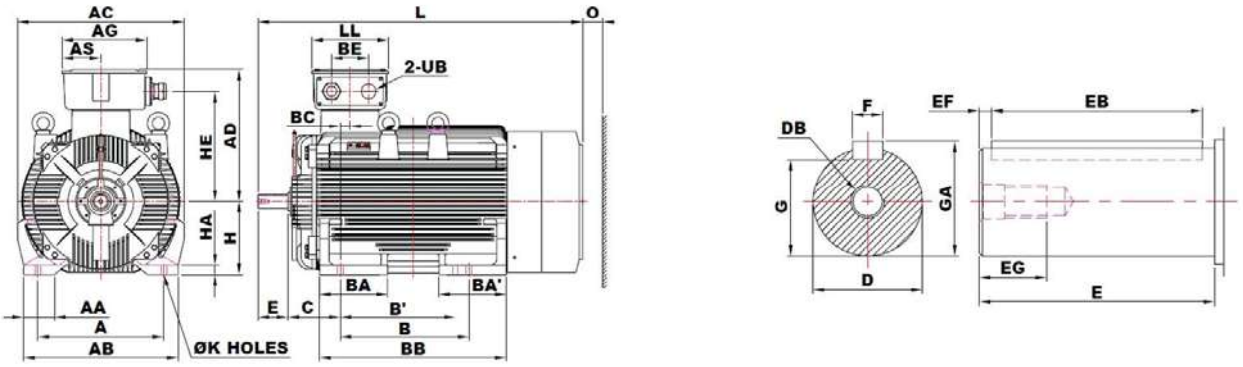


FIG. 6

FRAME SIZE	H	HA	HE	K	L	LL	O	UB	SHAFT EXTENSION									BEARING	
									D	E	EB	EF	EG	F	G	GA	DB	DRIVE END	OPPOSITE DRIVE END
250MA	250	30	322	24	921	255	105	M63x1.5	60	140	125	7.5	42	18	53	64	M20	6313C3	6313C3
250MC	250	30	322	24	921	255	105	M63x1.5	65	140	125	7.5	42	18	58	69	M20	6315C3	6313C3
280SA	280	35	354.5	24	1037.5	255	140	M63X1.5	65	140	125	7.5	40	18	58	69	M20	6314C3	6314C3
280SB	280	35	354.5	24	1037.5	255	140	M63X1.5	75	140	125	7.5	40	20	67.5	79.5	M20	6318C3	6316C3
280MA	280	35	354.5	24	1087.5	255	140	M63X1.5	65	140	125	7.5	40	18	58	69	M20	6314C3	6314C3
280MB	280	35	354.5	24	1087.5	255	140	M63X1.5	75	140	125	7.5	40	20	67.5	79.5	M20	6318C3	6316C3
315SA	315	35	430	28	1216	322	180	M63X1.5	65	140	125	7.5	40	18	58	69	M20	6316C3	6314C3
315SB	315	35	430	28	1246	322	180	M63X1.5	80	170	160	5	40	22	71	85	M20	6320C3	6316C3
315MA	315	35	430	28	1266	322	180	M63X1.5	65	140	125	7.5	40	18	58	69	M20	6316C3	6314C3
315MB	315	35	430	28	1296	322	180	M63X1.5	80	170	160	5	40	22	71	85	M20	6320C3	6316C3
315LA	315	45	430	28	1366	322	180	M63X1.5	65	140	125	7.5	40	18	58	69	M20	6316C3	6314C3
315LB	315	45	430	28	1396	322	180	M63X1.5	80	170	160	5	40	22	71	85	M20	6320C3	6316C3
315CA	315	45	485	28	1484	372	200	M72X2	75	140	125	7.5	40	20	67.5	79.5	M20	6316C3	6316C3
315CB	315	45	485	28	1514	372	200	M72X2	95	170	160	5	48	25	86	100	M24	6322C3	6322C3
315DA	315	45	485	28	1674	372	200	M72X2	75	140	125	7.5	40	20	67.5	79.5	M20	6316C3	6316C3
315DB	315	45	485	28	1704	372	200	M72X2	95	170	160	5	48	25	86	100	M24	6322C3	6322C3
355MA	355	45	540	28	1605	372	230	M72X2	80	170	140	5	40	22	71	85	M20	6318C3	6318C3
355MB	355	45	540	28	1645	372	230	M72X2	100	210	180	5	48	28	90	106	M24	6322C3	6322C3
355LA	355	45	540	28	1605	372	230	M72X2	80	170	140	5	40	22	71	85	M20	6318C3	6318C3
355LB	355	45	540	28	1645	372	230	M72X2	100	210	180	5	48	28	90	106	M24	6322C3	6322C3
355CA	355	45	540	28	1795	372	230	M72X2	80	170	140	5	40	22	71	85	M20	6318C3	6318C3
355CB	355	45	540	28	1835	372	230	M72X2	100	210	180	5	48	28	90	106	M24	6322C3	6322C3

Note:

1. All dimensions are in mm.
2. Tolerance of shaft end diameter D: 1) Ø55~Ø100:m6
3. Tolerance of shaft center high H : 1) 80~250: +0, -0.5, 2) 280~355: +0, -1
4. Data are subject to change without prior notice

General Electrical Formulas

	Formula	Units	Definitions/ Notes
Output	1HP=746W=0.746kW		HP: horsepower
Current	$I = \frac{E}{R}$	I in A	E: volt R: Ohm
Input power	$P_{in} = E \cdot I \cdot COS \quad \cdots\cdots\cdots\cdots (1\Phi)$ $P_{in} = \sqrt{3} \cdot E \cdot I \cdot COS \quad \cdots\cdots\cdots (3\Phi)$	P_{in} in W	E: volt I: ampere
Output power	$P_{out} = E \cdot I \cdot \quad \cdot COS \quad \cdots\cdots\cdots (1\Phi)$ $P_{out} = \sqrt{3} \cdot E \cdot I \cdot \quad \cdot COS \quad \cdots (3\Phi)$	P_{out} in W	η : efficiency cos Ø : power factor
Efficiency	$= \frac{P_{out}}{P_{in}} \quad 100\% = \frac{P_{in} \quad P_{loss}}{P_{in}} \quad 100\%$	P_{loss} in W	
Power factor	$COS \quad = \frac{P_{in}}{\sqrt{3} \cdot E \cdot I} \quad 100\% \cdots\cdots (3\Phi)$		
Synchronous speed	$N_S = \frac{120f}{P}$	N_s in $\min^{1}$	f: frequency of the power supply P: poles
Slip	$S = \frac{N_S \quad N}{N_S} \quad 100\%$		N: motor speed
Torque	$T = \frac{974kW}{N}$	T in kgf-m	1 kgf-m=9.8 N-m
Power	$P = 1.027NT$	P in W	
Starting time	$t_S = \frac{GD^2N}{375(T_M \quad T_L)}$	t_S in sec GD^2 in kgm^2	GD^2: inertia of system T_M: torque of motor
Braking time	$t_B = \frac{GD^2N}{375(T_M + T_L)}$	t_B in sec	T_L : torque of load
Reactive power absorbed by the motor	$Q = \sqrt{3} \cdot E \cdot I \cdot SIN \quad \cdots\cdots (3\Phi)$	Q in VAR	
Sound power level	$Lw = 10\log(\frac{P}{P_o})$ $(P_o = 10^{\ 12} W)$	Lw in dB	
Sound pressure level	$Lp = 20\log(\frac{P}{P_o})$ $(P_o = 2 \quad 10^{\ 5} P_a)$	Lp in dB	Pa=1 N/m^2

3PUMP

FIRE PUMP SUBMITTAL

Project Name:	
Client:	
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Contractor:	
Date:	
Revision:	

DIESEL ENGINE DATA SHEET

Powering the Future

- High Speed Diesel Engine
- Pump Set for Fire Fighting
- Fire Fighting Pump System

Specification of Diesel Engines

MODEL	380	480B	485B	490B	4100	4102	4105BZ	4108BZL	6102BQ	6102BZQ	6102BZS	6112T	6120T	6120Ti	6126Ti-1	6126Ti-2
TYPE	VERTICAL,WATER-COOLED,FOUR-STROKE,DIRECTION-INJECTOR															
NUMBER OF CYLINDERS	3	4	4	4	4	4	4	4	6	6	6	6	6	6	6	6
BORE*STROKE(MM)	80*90	80*90	85*95	90*100	100*105	102*118	105*118	108*118	102*118	102*118	102*118	112*135	120*130	120*130	126*130	126*130
RATE POWER(KW)	20	28	36	42	55	63.8	75	88	95	110	125	150	165	200	245	275
RATE POWER(HP)	27	38	49	57	75	84	102	120	130	150	170	204	225	272	334	374
RATE SPEED(R/MIN)	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
TOTAL DISPLACEMENT(L)	1.357	1.809	2.156	2.54	3.298	3.857	4.087	4.324	5.785	5.785	5.785	7.98	8.82	8.82	9.73	9.73
MAX.TORQUE(N.M)	72.6	99.8	118.2	149.7	193.1	231.8	260	280	372	420	470	760	1250	1250	1640	1640
MIN.SPECIFIC FUEL CONSUMPTION AT FULL LOAD	247	247	262	247	238	238	238	238	205	205	205	201	201	201	203	203
DIRECTION OF CRANKSHAFT ROTATION(FACING TO FLYWHEEL)	COUNTER-CLOCKWISE															
LUBRICATING METHOD	PRESSURE AND SPLASH LUBRICATING															
STARTING METHOD	ELECTRIC STARTING															
NET MASS(KG)	230	250	260	300	350	360	380	400	580	580	580	1200	1300	1300	1400	1400

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Date:	
Revision:	

JOCKEY PUMP DATA SHEET

3PUMP

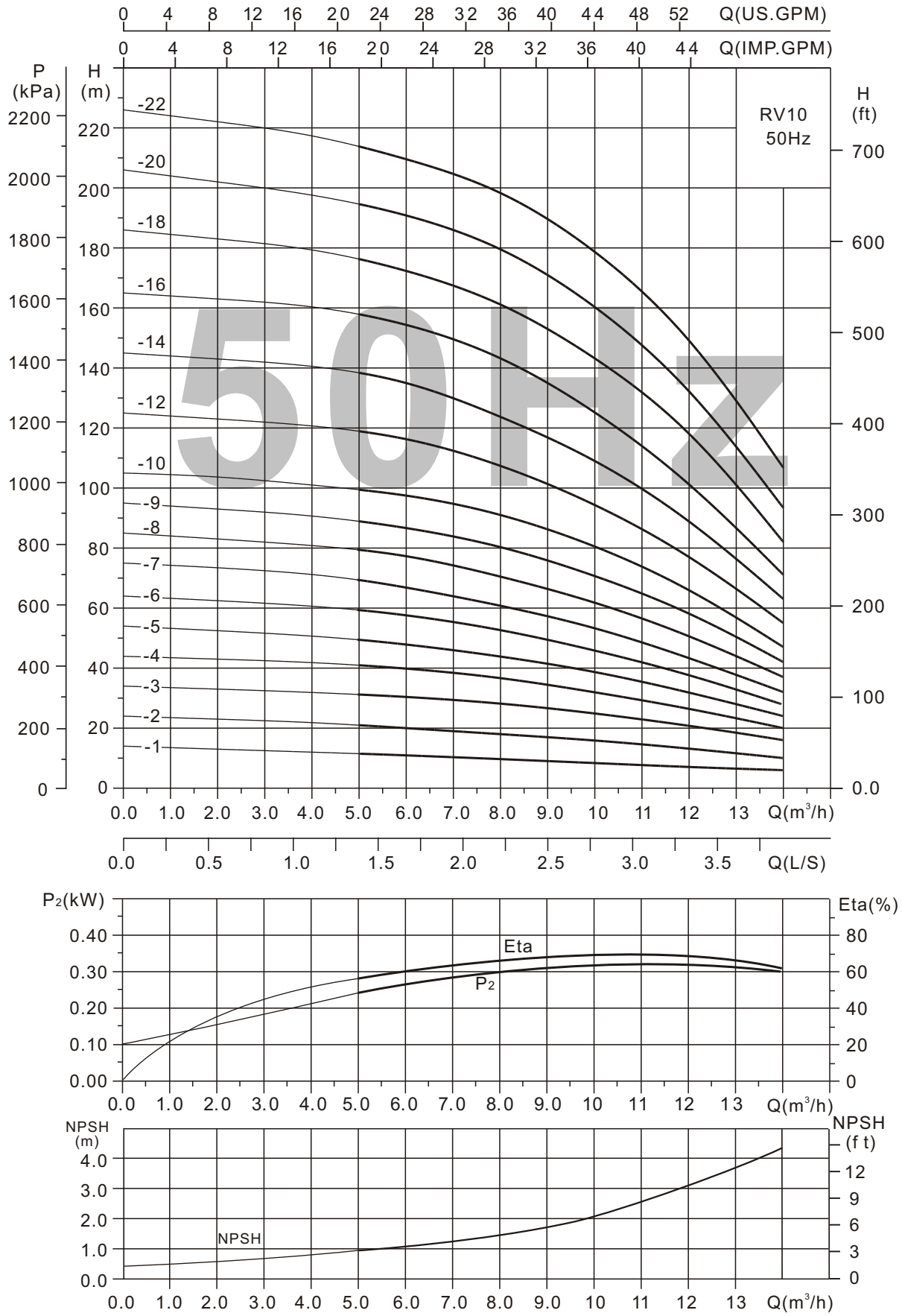
PRODUCT
CATALOGUE

NFPA

Vertical Multistage Centrifugal Pump

Performance Curve

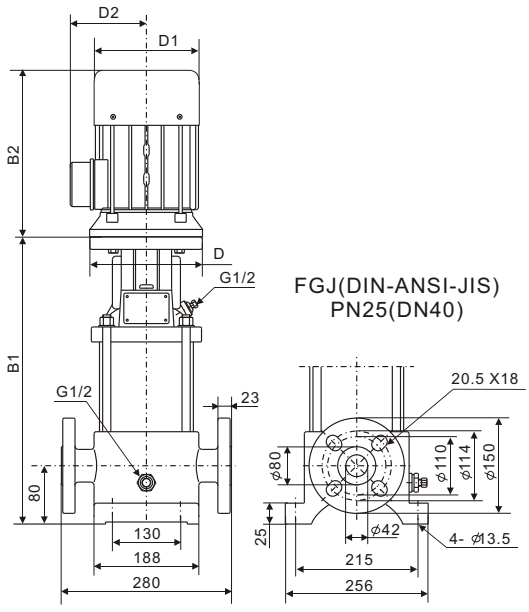
RV10-50Hz



Performance table

Model	Power P_2(kW)	Q (m^3/h)	2.0	4.0	6.0	8.0	10	12	14
RV10-1	0.37	H (m)	13	12	11	9.5	8.5	7	6
RV10-2	0.75		23	22	20	18	16	13	10
RV10-3	1.1		33	32	31	28	25	21	16
RV10-4	1.5		43	42	40	37	32	27	20
RV10-5	2.2		53	51	48	44	39	32	24
RV10-6	2.2		62	61	58	53	46	38	28
RV10-7	3.0		73	72	67	61	54	43	32
RV10-8	3.0		83	81	78	71	62	51	37
RV10-9	3.0		93	91	87	81	71	59	42
RV10-10	4.0		104	101	98	91	81	67	47
RV10-12	4.0		123	121	117	108	95	78	55
RV10-14	5.5		143	141	136	124	110	90	63
RV10-16	5.5		163	161	154	143	125	102	71
RV10-18	7.5		183	179	173	161	144	118	82
RV10-20	7.5		202	198	191	180	160	133	93
RV10-22	7.5		222	217	209	198	178	149	106

Installation sketch



Dimensions and weights

Model	Dimensions(mm)						Weight (kg)
	B1	B2	B1+B2	D	D1	D2	
RV10-1	322	205	527	–	133	102	38
RV10-2	352	205	557	–	133	102	40
RV10-3	388	241	629	–	154	111	43
RV10-4	418	241/293	659/711	–	154	111	50
RV10-5	456	275/293	731/749	–	177	116	53
RV10-6	486	275/293	761/779	–	177	116	55
RV10-7	516	293	791	–	177	116	60
RV10-8	546	293	818	–	177	116	61
RV10-9	576	293	848	–	177	116	63
RV10-10	626	305	931	–	197	148	65
RV10-12	686	305	991	–	197	148	68
RV10-14	761	390	1151	300	275	210	98
RV10-16	821	390	1211	300	275	210	100
RV10-18	881	390	1271	300	275	210	125
RV10-20	941	390	1331	300	275	210	128
RV10-22	1001	390	1361	300	275	210	130

3PUMP

FIRE PUMP SUBMITTAL

Project Name:	
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Date:	
Revision:	

VALVES DATA SHEET

GALA | Regulating Systems

GENERAL CATALOGUE

Catalogue 2018

GALA Regulating Systems

Company Profile

GALA - Extends Business on a Global Perspective.
GALA company offers a wide range of products and systems in the field of valves, piping, and seismic isolation for applications ranging from equipment for office buildings, fire fighting, heating, water works, sewerage, marine, industrial to top fluid control. Our aim is meaningful contribution to society by providing comfort and safety through our products, technical skills and services!

GALA - Professional Manufacturer of Industrial Valves
GALA have variety products to meet customer demand of different valve. Designing, manufacture and sale of one-stop service is the company's core strengths.

GALA products cover the following industry area:
Water supply system, water treatment, food, chemical, cement, air-conditioning systems, industry engineering, nuclear power, papermaking, Petrochemical Industry, pharmaceutical, Powder Industry, steel industry, sugar refining, textiles and so on. GALA anti-pollution environmental protection industry is one of the major business. GALA provides various valve for wastewater processing and exhaust gas processing.

GALA have wide variety of industrial valves, including following main products:
- ♦ Fire Protection Valve
- ♦ Balancing Valve
- ♦ Butterfly Valve
- ♦ Gate Valve, Globe Valve, Check Valve, Ball Valve, Strainer
- ♦ Bronze and Brass Valve
- ♦ Flexible Rubber Joint
- ♦ Flexible Stainless Steel Hose, Expansion Joint

Other Valves and fittings are also available from GALA.

All products will be designed, manufactured and assembly by GALA.

Resilient Seated NRS Type-Flange Ends
Fig.322FF
Standard:AWWA C515/BS5163
Size:DN50~DN600

Resilient Seated NRS Type-Flange-Groove Ends
Fig.322FG
Standard:AWWA C515/BS5163
Size:DN50~DN300

Resilient Seated NRS Type-Groove Ends
Fig.322GG
Standard:AWWA C515/BS5163
Size:DN50~DN300

Resilient Seated NRS Type-MJ-MJ Ends
Fig.322MJ
Standard:AWWA C515/BS5163
Size:DN80~DN300

Resilient Seated NRS Type-Flange-MJ Ends
Fig.322FM
Standard:AWWA C515/BS5163
Size:DN80~DN300

Resilient Seated OS&Y Type-Flange Ends
Fig.333FF
Standard: AWWA C515/BS5163
Size:DN50~DN600

Resilient Seated OS&Y Type-Flange-Groove Ends
Fig.333FG
Standard:AWWA C515/BS5163
Size:DN50~DN300

Resilient Seated OS&Y Type-Groove-Groove Ends
Fig.333GG
Standard:AWWA C515/BS5163
Size:DN50~DN300

Resilient Seated OS&Y Type-MJ-MJ Ends
Fig.333MJ
Standard:AWWA C515/BS5163
Size:DN80~DN300

Resilient Seated OS&Y Type-Flanged-MJ Ends
Fig.333FM
Standard:AWWA C515/BS5163
Size:DN80~DN300

Swing Check Resilient Seated Flanged Ends
Fig.55FF
Standard:AWWA C508
Size:DN50~DN300

Resilient Seated Grooved Ends
Fig.50GG
Standard:AWWA C508
Size:DN50~DN200

Resilient Seated Check Wafer Ends
Fig.50W
Standard:API 594
Size:DN50~DN300

Y Strainer Flange-Flange Ends
Fig.70FF
Size:DN50~DN300

Y Strainer Flange--Groove Ends
Fig.70FG
Size:DN50~DN300

Y Strainer Groove--Groove Ends
Fig.70GG
Size:DN50~DN300

Butterfly Valve Resilient Seated Wafer Ends
Fig.25W
Size: DN50~DN300

Butterfly Valve Resilient Seated Lug Ends
Fig.25L
Size: DN50~DN300

Butterfly Valve Resilient Seated Groove Ends
Fig.25GG
Size: DN50~DN300

Air Release Valve
Fig.9712
Size: DN15~DN25

ONTOR

Best manufacturer of valves

Valves for Fire Protection

CONTENT

Resilient seated NRS gate valve grooved end

Name of parts	Material
Body	Ductile iron
Wedge	Ductile iron+EPDM
Stem nut	Bronze
Stem	SS431 or SS304, SS316, bronze
Bonnet	Ductile iron
Bonnet Gasket	EPDM
Sealing Ring	EPDM
Upper cover	Ductile iron
Sliding disc	Bronze
Screw	Carbon steel with hot galvanization
O-rings	EPDM
Handwheel	Ductile iron

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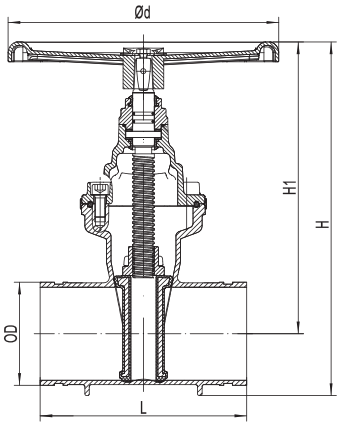
Model No. 1107

Technical data >

- Sizs: DN50/60~DN200/219
- Working pressure: PN25, 362PSI
- Valve standard: AWWA C515
- Grooved standard: AWWA C606
- Temperature range: 0 ~ 80℃



Dimensions		Pressure rating	Size (mm)				
DN	inch	psi	ΦD	L	H1	H	Φd
50	2	362	60.3	178	256	301	203
65	2.5	362	73	190	256	307.5	203
			76.1			309	
80	3	362	88.9	203	273.5	333	203
100	4	362	114.3	229	323.5	396	300
125	5	362	139.7	254	376	461	300
			141.3			462	
150	6	362	165.1	267	423.5	521	300
			168.3			523	
200	8	362	219.1	292	530.5	660	406

Resilient seated OS&Y gate valve-grooved end

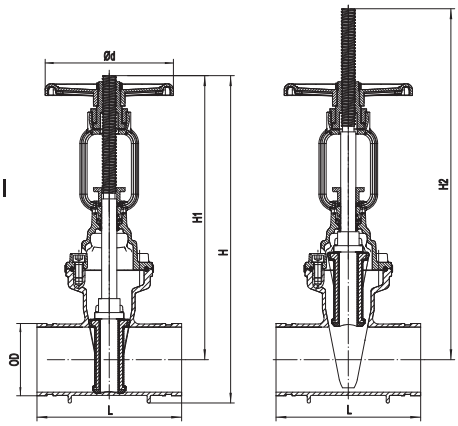
Name of parts	Material
Body	Ductile iron
Wedge	Ductile iron+EPDM
Stem nut	Bronze
Stem	SS431 or SS304, SS316, bronze
Bonnet	Ductile iron
Bonnet Gasket	EPDM
Sealing Ring	EPDM
Yoke	Ductile iron
Sliding disc	Bronze
Screw	Carbon steel with hot galvanization
O-rings	EPDM
Handwheel	Ductile iron

c UL us LISTED

Model No. 1207

Technical data >

- Sizs: DN50/60~DN200/219
- Working pressure: PN25, 362PSI
- Valve standard: AWWA C515
- Grooved standard: AWWA C606
- Temperature range: 0 ~ 80℃



Dimensions		Pressure rating	Size (mm)					
DN	inch	psi	OD	L	H1	H2	H	Φd
50	2	362	60.3	178	358.5	420.5	403.5	203
65	2.5	362	73	190	359.5	429.5	411	203
			76.1					
80	3	362	88.9	203	378	462	437.5	203
100	4	362	114.3	229	449.5	553	518.5	203
125	5	362	139.7	254	549.5	677	631	300
			141.3					
150	6	362	165.1	267	591.5	747	686	300
			168.3					
200	8	362	219.1	292	735.5	938	865	330

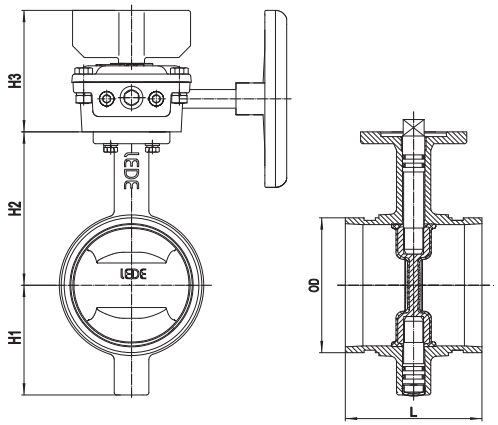
ONTOR

Butterfly valve with tamper switch grooved end

Model No. 2401

c UL us LISTED

Name of parts	Material
Body	Ductile iron
Plug	EPDM
Driven shaft	1Cr17Ni2
Disc	Ductile iron and EPDM
Actuating shaft	1Cr17Ni2
Bearing bush	Bronze
O-rings	EPDM
Gear operator	Ductile iron and steel



Technical data >

- Sizs: 60.3~219.1
- Working pressure: 60.3~168.3 362 psi, 219.1 232psi
- Valve standard: MSS SP-67
- Grooved standard: AWWA C606
- Top Flange standard: EN ISO 5211
- Temperature range: 0 ~ 80℃
- Suitable for indoor and outdoor use

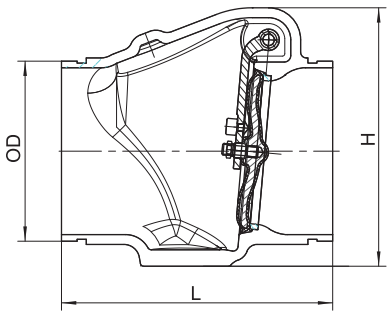
Dimensions		Pressure rating	Size (mm)					
DN	inch	psi	OD	L	H1	H2	H3	Top Flange
50	2	362	60.3	81	56	91	103	F05
65	2.5	362	73	96.8	68	104	103	F05
			76.1					
80	3	362	88.9	96.8	75	111	103	F07
100	4	362	114.3	115.8	93	130	103	F07
125	5	362	139.7	147.6	111	153	103	F07
			141.3		111	153		
150	6	362	165.1	147.6	123	165	103	F07
			168.3		123	165		
200	8	362	219.1	133.4	160	194	109	F07

Swing check valve with grooved end

Name of parts	Material
Body	Ductile iron
Seat Ring	Bronze
Disc Sealing Ring	EPDM
Disc Plate	SS304
Disc	Ductile iron
Clapper Arm	Ductile iron
Bonnet Gasket	EPDM
Bonnet	Ductile iron
Hinge Pin	SS304
Hinge Bushing	Bronze
Hinge Plug	SS304

c UL us LISTED

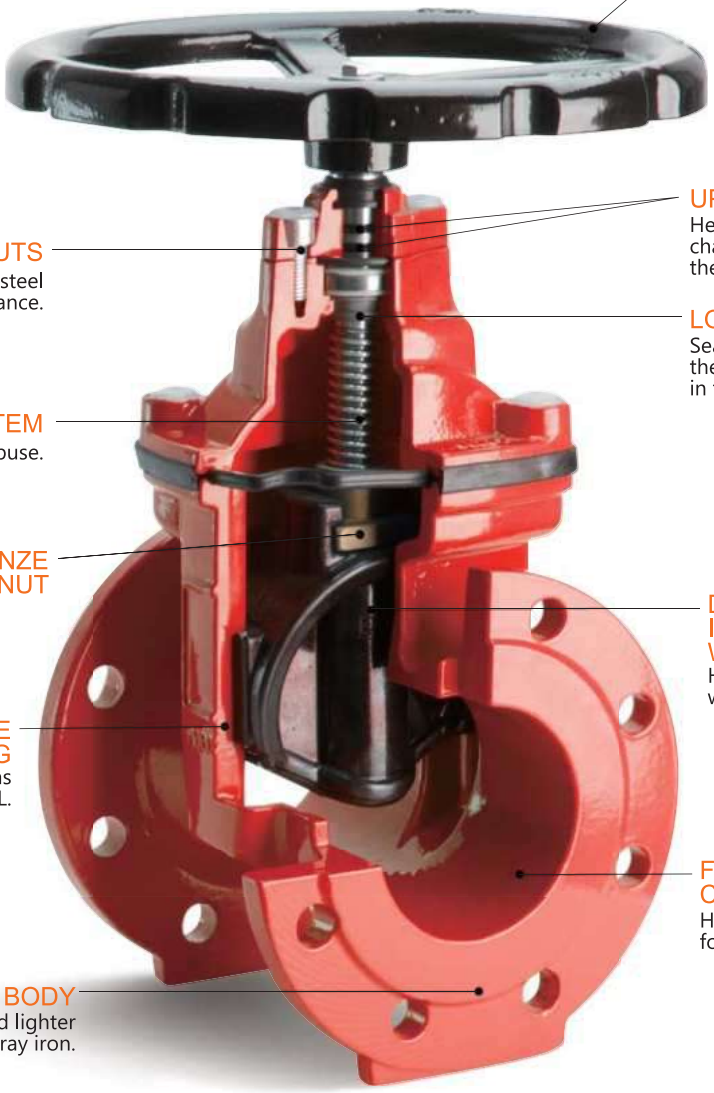
Model No. 3102



Technical data >

- Sizs: 2"~12"
- Working pressure: 362psi
- Grooved standard: AWWA C606
- Temperature range: 0 ~ 80℃

Dimensions		Pressure rating	Size (mm)		
DN	inch	psi	OD	L	H
50	2	362	60.3	167	122.5
65	2.5	362	73	180	136.5
			76.1		
80	3	362	88.9	198	165.5
100	4	362	114.3	229	193.6
125	5	362	139.7	254	235.5
			141.3		
150	6	362	165.1	272	252
			168.3		
200	8	362	219.1	330	314.5



DUCTILE IRON HAND WHEEL
Provides strength and durability.

UPPER O-RING SEALS
Helps isolate the lubrication chamber as well as shield the stem from dirt and grit.

BOLTS & NUTS
304 stainless steel or carbon steel for corrosion resistance.

LOWER SEALING DEVICE
Seals lubrication chamber and enables the replacement of O-Rings in the working condition.

STAINLESS STEEL STEM
Resists corrosion and abuse.

HIGH-STRENGTH BRONZE WEDGE NUT

DUCTILE IRON WEDGE IS ENCAPSULATED WITH EPDM RUBBER
Helps ensure zero leakage with low stem torque.

360 PSI PRESSURE RATING
Standard for AWWA as well as FM and UL.

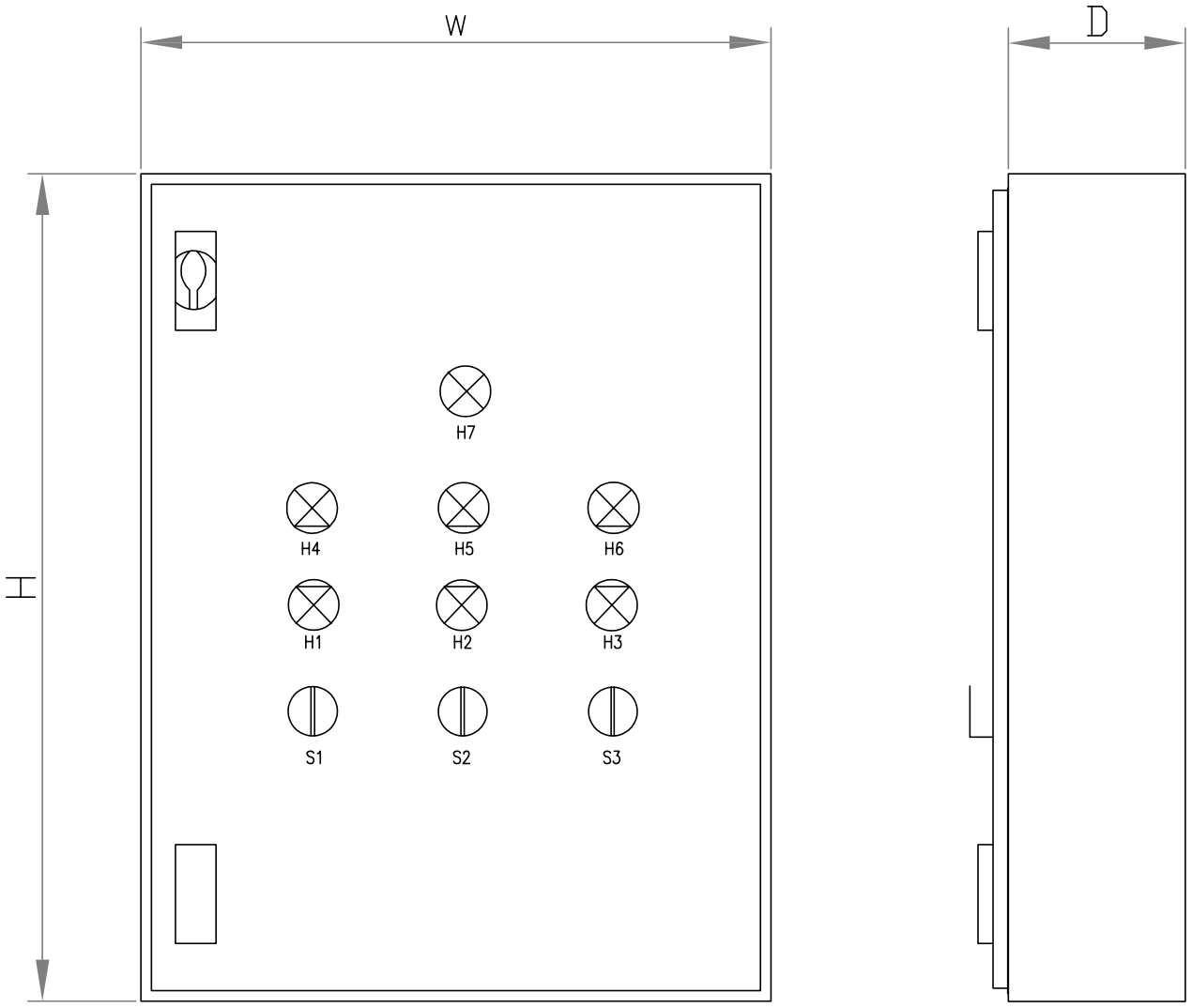
FUSION-BONDED EPOXY COATING INSIDE & OUT
Helps ensure corrsion resistance for long service life.

DUCTILE IRON VALVE BODY
Greater strength, durability and lighter weight than cast gray iron.

FIRE PUMP SUBMITTAL

Project Name:	
Client:	
Consultant:	
Contractor:	
Date:	
Revision:	

CONTROL PANEL



PANEL FRONT VIEW

SIDE VIEW

TECHNICAL SPECIFICATIONS

SYSTEM VOLTAGE >

CONTROL SUPPLY : 415 V / 3PH / 50Hz :- (Y / Δ)

ENCLOSURE >

ELECTRO GALVANISED SHEET STEEL
ENCLOSURE TO PROTECTION STANDARD – IP55

TYPE OF MOUNTING : WALL
CABLE ENTRY : BOTTOM
PAINT FINISH : EPOXY PAINTED, POWDER COATED TO PEBBLE GRAY, RAL–7032

WIRING >

MINIMUM L.V. CONTROL WIRES – 1.5 mm FLEXIBLE
ALL CONTROL WIRING FERRULED AT ENDS AS PER WIRING DIAGRAM

LABELS >

FACIA LEGEND PLATES OF 2MM ENGRAVED TRAFFOLYTE WITH BLACK LETTERS ON WHITE BACKGROUND.

LEGEND >

H1– RUN INDICATION FOR MAIN PUMP
H2– RUN INDICATION FOR JOCKEY PUMP
H3– DIESEL PUMP RUN
H4– TRIP INDICATION FOR MAIN PUMP
H5– TRIP INDICATION FOR JOCKEY PUMP
H6– DC HEALTHY
H7– POWER ON
S1– H–O–A– SELECTORE SWITCH FOR MAIN PUMP
S2– H–O–A– SELECTORE SWITCH FOR JOCKEY PUMP
S3– H–O–A– SELECTORE SWITCH FOR DIESEL PUMP

ENCLOSURE DIMENSIONS IN MM

MOTOR POWER(KW)	H	W	D
22–30 KW	700MM	500MM	250
37 KW	800MM	600MM	250
55 KW	800MM	600MM	250
75 KW	800MM	800MM	300
90 KW	800MM	800MM	300
110 KW	1000MM	1000MM	300

3PUMP

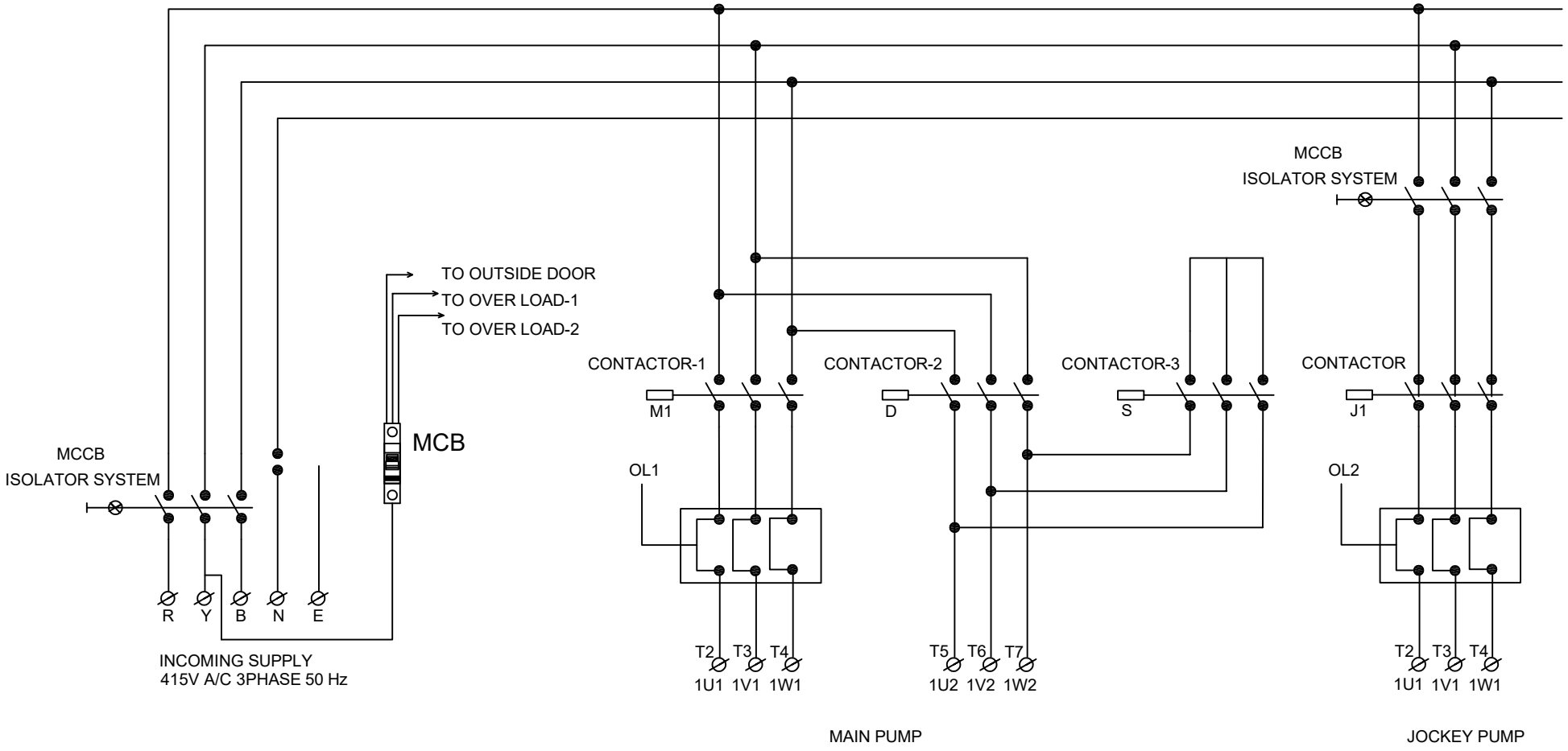
TITLE :-

REV NO	DATE	DESCRIPTION	DRN.BY	CKD.BY	APP.BY
0	28/01/2026		NIYAS AJ	HASSAN	HAMZA

SCALE :- NTS

DRAWING NO: 001

REV 0



3PUMP

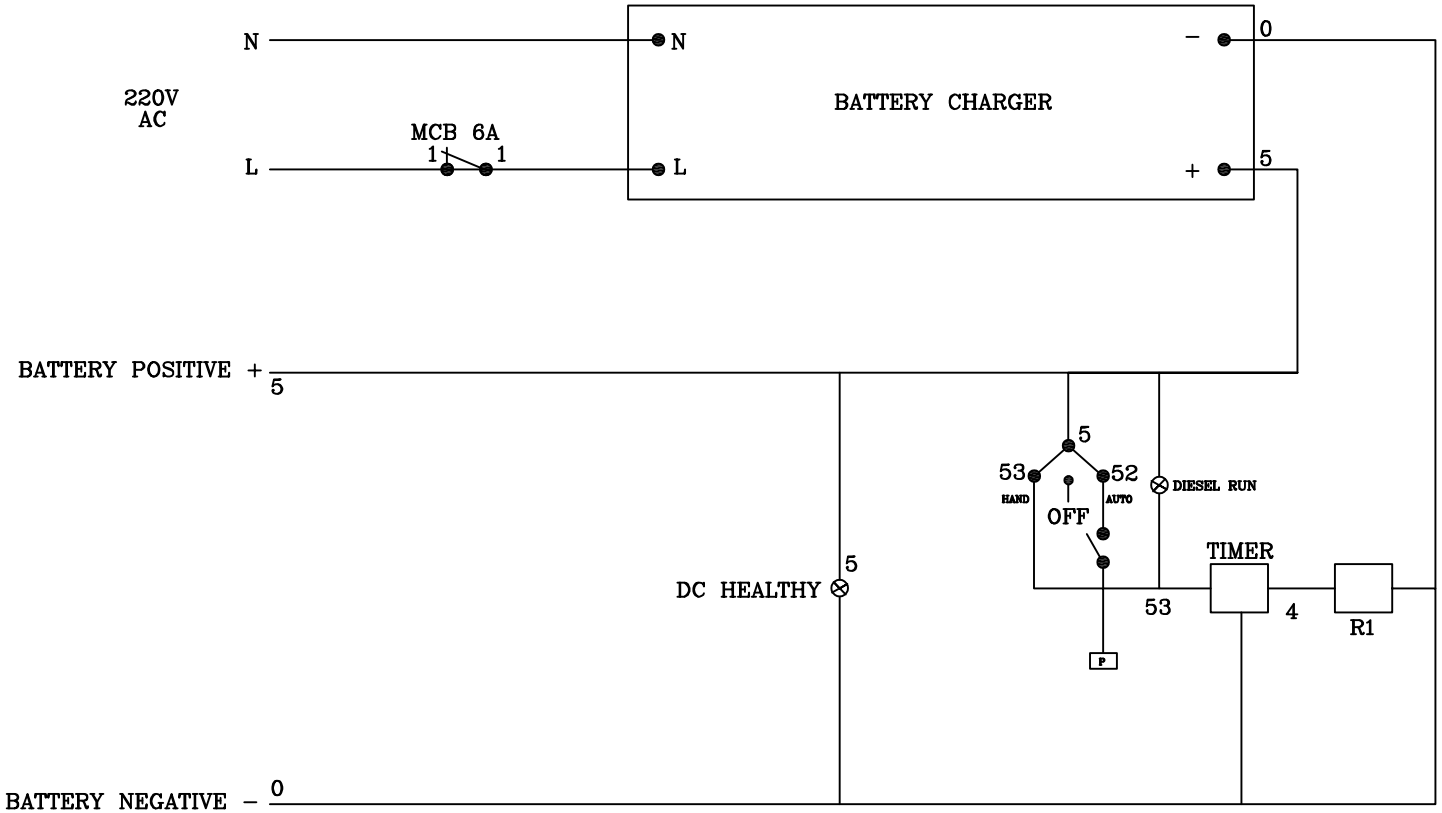
TITLE :-

0	28/01/2026		NIYAS AJ	HASSAN	HAMZA
REV NO	DATE	DESCRIPTION	DRN.BY	CKD.BY	APP.BY

SCALE :- NTS

DRAWING NO: 002

REV 0



CONTROL CIRCUIT FOR DIESEL

3PUMP

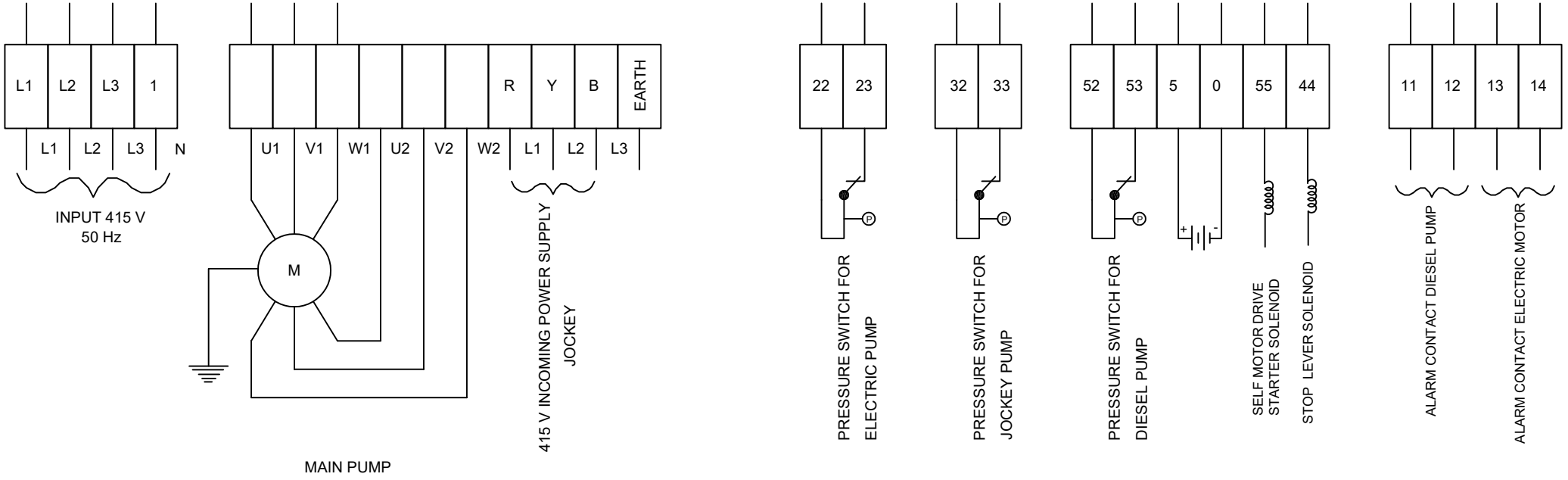
TITLE :-

0	28/01/2026		NIYAS AJ	HASSAN	HAMZA
REV NO	DATE	DESCRIPTION	DRN.BY	CKD.BY	APP.BY

SCALE :- NTS

DRAWING NO: 003

REV 0



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REV NO	DATE	DESCRIPTION	DRN.BY	CKD.BY	APP.BY

3PUMP

TITLE :-

SCALE :- NTS	DRAWING NO: 004	REV 0