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CUSTOMER NAME PROJECT

PENGHEMATAN TAHUNAN
(IDR)

216.439.104

WAKTU BALIK MODAL (#YRS)

3,82



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PENGHEMATAN TAHUNAN (IDR)

216.439.104

WAKTU BALIK MODAL (#YRS)

3,82

PENGHEMATAN ENERGI (kWh/#YR)

154599PENGURANGAN EMISI (CO₂ TON/THN)**118,89**

INVESTASI (IDR)

932.223.000

Penjelasan Singkat

Dari hasil tinjauan Energy Check kami menunjukkan adanya potensi penghematan sebesar (IDR) 216.439.103,92 per tahun dari biaya listrik saat ini apabila dilakukan sedikit improvisasi pada instalasi pompa Anda.

Estimasi penghematan ini berdasarkan inspeksi terhadap 20 pompa yang terpasang pada pabrik/gedung Anda. Dengan melakukan investasi pengadaan pompa baru yang lebih hemat energi dan sedikit improvisasi pada sistem, maka perusahaan Anda dapat mengurangi pemakaian listrik sebesar 154.599,36 kWh per tahun. Investasi yang diperlukan adalah sebesar IDR 932.223.000,00 dan akan balik modal dalam waktu 3,82 tahun.

Dalam laporan ini akan dijelaskan lebih detail bagaimana Anda dapat mencapainya.

Semoga rekomendasi yang kami sampaikan dalam laporan Energy Check ini dapat bermanfaat. Kami bersedia membantu Anda dalam setiap langkah untuk mencapai penghematan tersebut, dan semoga keuntungan operasional, manfaat bagi lingkungan dan keunggulan bisnis dari rekomendasi ini dapat terealisasi sesuai harapan.

Apabila diperlukan bantuan lebih lanjut untuk menjelaskan laporan ini kepada pihak lain dalam perusahaan Anda, mohon kiranya dapat menghubungi kami.

Bayu Kristanto
Grundfos
bkristanto@grundfos.com





BIAYA SIKLUS HIDUP POMPA

Mengapa Energy Check begitu penting

Energy Check membantu Anda menemukan peluang penghematan yang tersembunyi dalam sistem pompa Anda. Tujuannya adalah untuk melakukan identifikasi terhadap pompa mana sajakah yang memiliki potensi penghematan



Bagaimana Energy Check dilakukan



International
Organization for
Standardization

Energy Check dilakukan berdasarkan ISO 14414 mengenai Pump System Energy Assessment Standard dan merupakan perhitungan teoritis dengan akurasi +/- 10% sebagai berikut:

Data utama	Nameplate motor/pompa	Informasi dari pemakai
Head & flow pompa	•	
Daya motor	•	
Jam operasi/thn		•
Tahun pemasangan		•
Penggunaan pompa		•
Kebutuhan operasional		•

Tabel di atas menunjukkan informasi penting yang diperlukan dalam Energy Check dan dari mana informasi tersebut didapat pada saat survey lapangan.

Dari data tersebut, kami menghitung potensi penghematan energi dari setiap pompa yang ditinjau. Laporan Energy Check berdasarkan pada asumsi bahwa instalasi sistem pompa tidak berubah kecuali penggantian pompa itu sendiri.



Hasil Energy Check

PENGHEMATAN TAHUNAN (IDR)
216.439.104

WAKTU BALIK MODAL (#YRS)
3,82

PENGHEMATAN ENERGI (KWH/#YR)
154.599,36

INVESTASI (IDR)
932.223.000

Perincian potensi penghematan

Dari data yang dikumpulkan selama melakukan Energy Check, kami menghitung potensi penghematan energi pada setiap pompa yang ditinjau. Selanjutnya kami memperhitungkan biaya pembelian pompa baru yang lebih hemat energi, biaya operasi tahunan akibat penggantian pompa baru tersebut dan waktu balik modalnya.

Dengan investasi sebesar IDR 932.223.000,00 untuk potensi penghematan energi 154.599,36 kWh dapat dicapai dengan waktu balik modal selama 3,82 tahun.

Lebih lengkapnya diberikan di bawah ini:

Data pompa

Jumlah pompa yang dikenali	20
Jumlah pompa dengan potensi penghematan energi	19

Data yang didapat

Tarif per kWh (IDR)	1.400,00
Kenaikan harga listrik tahunan (%)	5,0
Periode balik modal (payback) yang diharapkan	5,00
Tingkat CO ₂ (g/kWh)	769,0

Siklus hidup pompa

Penghematan setelah 10 tahun	1.926.242.179,05
Penghematan setelah 15 tahun	3.971.744.215,22

Data keuangan

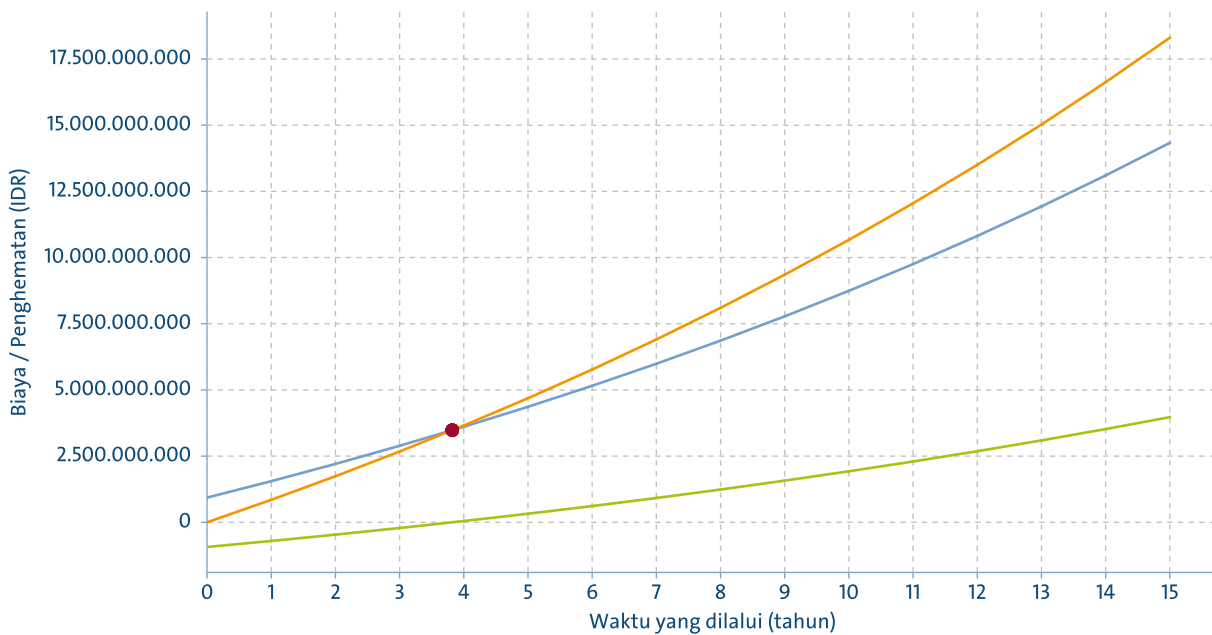
Perlengkapan pompa baru (IDR)	932.223.000,00
Instalasi dan komisioning (IDR)	0,00
Aksesoris (IDR)	0,00
Kontrak servis (IDR)	0,00
#Maintenance of cost of existing system (IDR)	-0,00
#Grants/Incentives (IDR)	-0,00
Investasi Total (IDR)	932.223.000,00



95% dari biaya siklus hidup pompa berkaitan dengan biaya listrik, biaya servis dan pemeliharaan

Harga pembelian pompa baru hanya berkontribusi sekitar 5% dari total biaya keseluruhan operasional pompa. Biaya pemeliharaan sekitar 10%, sementara 85% sisanya adalah biaya-biaya yang diperlukan agar pompa tersebut dapat bekerja. Biaya siklus hidup pompa dipengaruhi banyak faktor, namun biaya listrik dan pemeliharaan adalah faktor yang paling penting untuk dipertimbangkan.

Energy Check memberikan gambaran yang realistis mengenai biaya total kepemilikan pompa (cost of ownership). Di bawah ini diberikan perbandingan antara biaya sistem pompa eksisting terhadap biaya sistem pompa Grundfos yang hemat energi selama periode 15 tahun.



- Sistem eksisting
- Sistem baru
- Penghematan
- Awal dari penghematan

Peluang penghematan dengan sistem baru

Investasi Awal (IDR)	932.223.000,00
Penghematan setelah 10 tahun (IDR)	1.926.242.179,05
Penghematan setelah 15 tahun (IDR)	3.971.744.215,22



KEUNTUNGAN OPERASIONAL

- Keandalan Operasional
- Tingkat kerusakan rendah
- Mengurangi waktu gangguan
- Mengurangi biaya perbaikan
- Gambaran lengkap instalasi pompa



MANFAAT LINGKUNGAN

- Pengurangan emisi CO₂
- Profil perusahaan lebih ramah lingkungan
- Analisis siklus hidup pompa dan dokumentasi
- Kepatuhan terhadap peraturan terkait energi

PENGURANGAN EMISI (CO₂ TON/THN)

118,89

Keuntungan di luar laporan neraca (balance sheet)

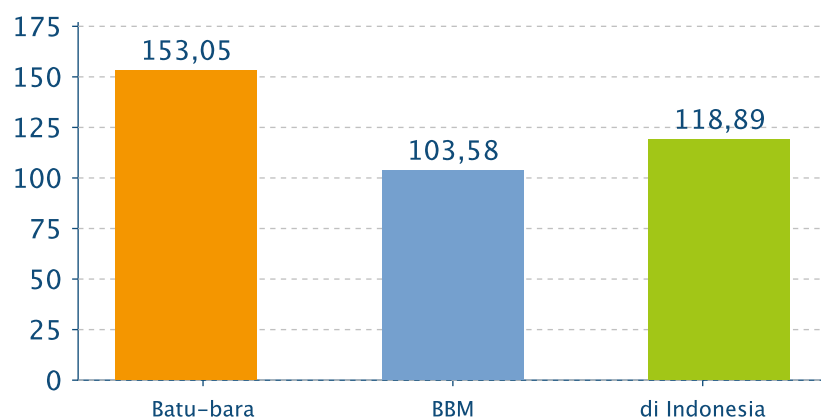
Energy Check memberikan pemahaman lebih baik untuk mengurangi pemakaian listrik pada pompa Anda yang berakibat pula pada penurunan biaya operasional dengan investasi jangka pendek.

Mengganti dengan pompa yang lebih hemat energi memberikan keuntungan operasional, manfaat lingkungan dan juga keunggulan bisnis.

Keputusan untuk berinvestasi dengan pompa hemat energi akan mendukung profil perusahaan sebagai perusahaan yang ramah lingkungan, menurunkan emisi karbon dan turut menerapkan peraturan bidang energi.

Dampak Lingkungan

Berdasarkan data International Energy Agency (IEA) terakhir mengenai emisi CO₂, gambar di bawah ini menunjukkan pengurangan CO₂ per tahun akibat pemakaian pompa hemat energi Grundfos apabila sumber listrik tersebut berasal dari batu-bara, BBM atau kombinasi keduanya tergantung dari negara yang ditinjau.



Potensi penghematan energi pompa Anda dapat dilihat pada halaman berikut.

Hasil detail

JUMLAH POMPA YANG DITINJAU

 JUMLAH POMPA DENGAN
POTENSI PENGHEMATAN

PENGHEMATAN ENERGI (kWh/#YR)

20
19
154.599,36

COMPRESSOR ROOM - PILOT PLANT

Tag	Merk	Nama produk	Kwantitas	Flow (m ³ /h)	Head (m)	Jam operasi/tahun	Potensi penghematan (kWh/#yr)	Penggantian Grundfos
PP COOLING WATER PUMPSERO 1		SRN 443	1	6,24	31,00	4000	1.685,47	CM 10-2 A-R-A-E-AVBE F-A-A-N
PP COOLING WATER PUMPSERO 2		SRN 443	1	6,24	31,00	4000	1.685,47	CM 10-2 A-R-A-E-AVBE F-A-A-N

CHILLER ROOM - SDC

Tag	Merk	Nama produk	Kwantitas	Flow (m ³ /h)	Head (m)	Jam operasi/tahun	Potensi penghematan (kWh/#yr)	Penggantian Grundfos
SDC CHILLED WATER PUMPAJAX 1		ELITE 65 - 32 - AXOC	1	27,00	40,00	2666	6.098,40	NBG 80-50-315/331 AAF2KESBQQEMW3
SDC CHILLED WATER PUMPAJAX 2		ELITE 65 - 32 - AXOC	1	27,00	40,00	2666	6.098,40	NBG 80-50-315/331 AAF2KESBQQEMW3
SDC CHILLED WATER PUMPAJAX 3		ELITE 65 - 32 - AXOC	1	27,00	40,00	2666	6.098,40	NBG 80-50-315/331 AAF2KESBQQEMW3

COMPRESSOR ROOM - PP1

Tag	Merk	Nama produk	Kwantitas	Flow (m ³ /h)	Head (m)	Jam operasi/tahun	Potensi penghematan (kWh/#yr)	Penggantian Grundfos
PP1 COOLING WATER PUMPEBARA 1		80 X 65 FS4KA	1	24,00	40,00	80	31,18	NBG 50-32-160/177 AAF2BESBAQELW1
PP1 COOLING WATER PUMPEBARA 2		80 X 65 FS4KA	1	24,00	40,00	80	31,18	NBG 50-32-160/177 AAF2BESBAQELW1
PP1 COOLING WATER PUMPEBARA 1		80 X 65 FSG	1	47,00	25,00	8000	15.640,28	NBG 65-50-160/151 AAF2BESBAQELW1



BOILER ROOM 7 TON - PP1

Tag	Merk	Nama produk	Kwantitas	Flow (m ³ /h)	Head (m)	Jam operasi/tahun	Potensi penghematan (kWh/#yr)	Penggantian Grundfos
PP1 - FEED WATER PUMP 1	GRUNDFOS	CR 8-140	1	8,00	70,00	4000	5.023,96	CR 10-9 A-FJ-A-E-HQQE
PP1 - FEED WATER PUMP 2	GRUNDFOS	CR 8-140	1	8,00	70,00	4000	5.023,96	CR 10-9 A-FJ-A-E-HQQE

BOILER ROOM 10 TON - PP1

Tag	Merk	Nama produk	Kwantitas	Flow (m ³ /h)	Head (m)	Jam operasi/tahun	Potensi penghematan (kWh/#yr)	Penggantian Grundfos
PP1 FEED WATER PUMP 1	GRUNDFOS	CR 16-100	1	11,50	70,00	2000	3.395,60	CR 10-10 A-FJ-A-E-HQQE

AIR FRESH ROOM - CP1

Tag	Merk	Nama produk	Kwantitas	Flow (m ³ /h)	Head (m)	Jam operasi/tahun	Potensi penghematan (kWh/#yr)	Penggantian Grundfos
CP1 COOLING WATER PUMP 1	TORISHIMA	ETA - 80 X 65 - 345	1	25,00	25,00	4000	3.462,82	NBG 50-32-160/152 AAF2BESBQQEKW 1
CP1 COOLING WATER PUMP 2	TORISHIMA	ETA - 80 X 65 - 345	1	25,00	25,00	4000	3.462,82	NBG 50-32-160/152 AAF2BESBQQEKW 1

COMPRESSOR ROOM - SPP1

Tag	Merk	Nama produk	Kwantitas	Flow (m ³ /h)	Head (m)	Jam operasi/tahun	Potensi penghematan (kWh/#yr)	Penggantian Grundfos
SPP1 COOLING WATER PUMP 1	TORISHIMA	ETA - 100 X 80 - 45	1	50,00	40,00	4000	19.041,04	NBG 65-50-160/177 AAF2BESBQQENW 1
SPP1 COOLING WATER PUMP 2	TORISHIMA	ETA - 100 X 80 - 45	1	50,00	40,00	4000	19.041,04	NBG 65-50-160/177 AAF2BESBQQENW 1



COMPRESSOR ROOM SPP2

Tag	Merk	Nama produk	Kwantitas	Flow (m ³ /h)	Head (m)	Jam operasi/tahun	Potensi penghematan (kWh/#yr)	Penggantian Grundfos
SPP2 COOLING WATER PUMP 1	EBARA	80 X 65 FSG	1	40,00	30,00	8000	15.224,11	NBG 65-50-160/158 AAF2BESBQQELW 1
SPP2 COOLING WATER PUMP 2	TORISHIMA	ETA-N 65 X 50 - 160	1	40,00	30,00	8000	15.224,11	NBG 65-50-160/158 AAF2BESBQQELW 15

CHILLER ROOM - SPP2

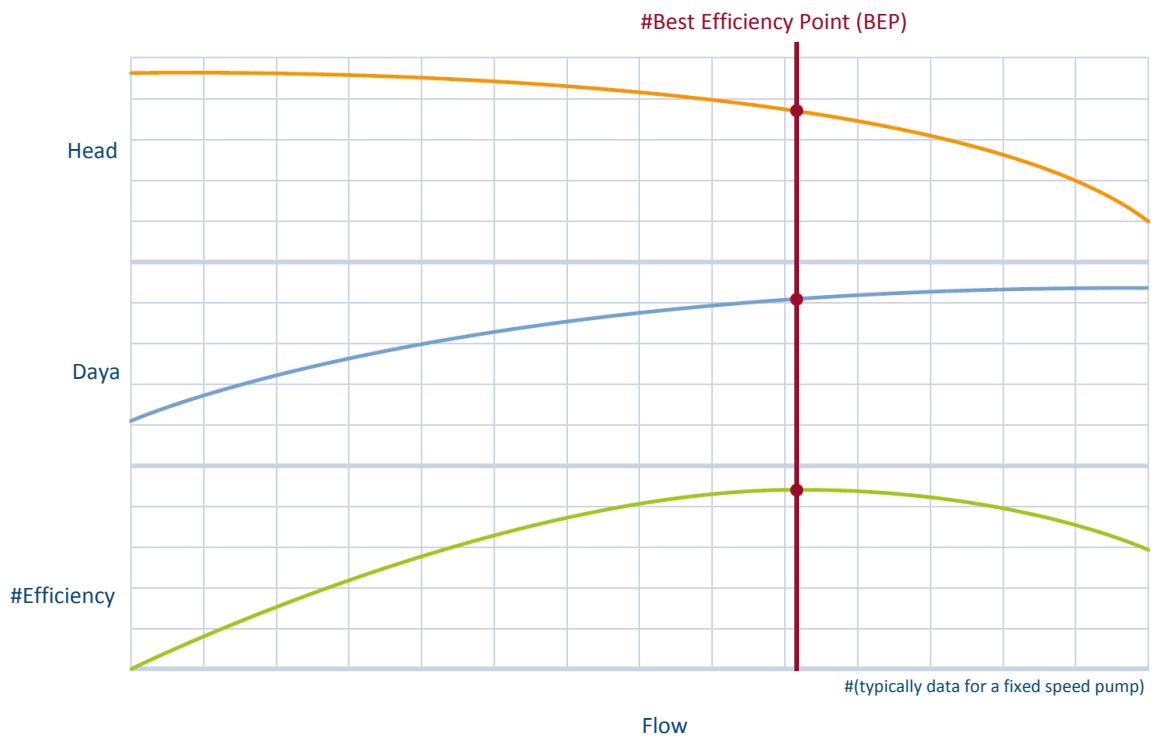
Tag	Merk	Nama produk	Kwantitas	Flow (m ³ /h)	Head (m)	Jam operasi/tahun	Potensi penghematan (kWh/#yr)	Penggantian Grundfos
SPP2 CHILLEC WATER PUMP 1	TORISHIMA	ETA-N 50 X 40 - 250	1	32,00	55,00	8000	14.165,55	NBG 50-32-200/214 AAF2BESBAQENW 1
SPP2 CHILLEC WATER PUMP 2	TORISHIMA	ETA-N 50 X 40 - 250	1	32,00	55,00	8000	14.165,55	NBG 50-32-200/214 AAF2BESBAQENW 1



Optimalkan penggunaan pompa Anda

Sangat disarankan agar tim teknis Anda memastikan bahwa pompa selalu bekerja pada titik efisiensi hidrolik terbaiknya atau yang disebut sebagai Best Efficiency Point (BEP). Efisiensi hidrolik terbaik berarti pompa tersebut bekerja dengan biaya terendah untuk setiap galon air yang dipompakan. Parameter ini penting bagi Energy Check Grundfos untuk menjadi kunci ditemukannya potensi penghematan pompa Anda.

Lebih penting lagi bahwa pada kondisi tersebut pompa bekerja lebih handal dan lebih tahan lama. Pompa akan bekerja optimum dengan biaya terendah dan lebih ramah lingkungan.



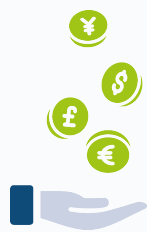
Untuk mendapatkan manfaat terbaik dari suatu pompa, perlu dipastikan bahwa pompa bekerja pada titik tertinggi dari efisiensi hidroliknya.

Untuk informasi lebih lanjut bagaimana Grundfos dapat membantu Anda dalam mencapai kinerja pompa yang optimum, silahkan menghubungi Grundfos setempat atau partner kami di kota Anda, atau kunjungi www.grundfos.com/energy

Kesimpulan dan saran

Awali langkah penghematan energi Anda!

Dalam laporan Energy Check ini, kami mempelajari sebanyak 20 pompa dengan 19 pompa teridentifikasi dapat memberikan potensi penghematan energi



PENGHEMATAN TAHUNAN (IDR)

216.439.104

WAKTU BALIK MODAL (#YRS)

3,82



PENGHEMATAN ENERGI (kWh/#YR)

154.599,3

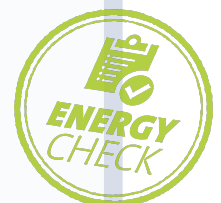
PENGURANGAN EMISI (CO₂ TON/THN)

118,89

Ada uang yang dapat dihemat dari pompa-pompa Anda

Dalam analisa kami ditemukan potensi penghematan **(IDR)216.439.104** dari biaya operasi tahunan dengan investasi sebesar **(IDR)932.223.000,0** untuk pengadaan pompa-pompa baru. Hanya dalam waktu **3,82** tahun, investasi tersebut akan kembali dan dengan sistem pompa yang baru dan lebih efisien akan terus berlanjut memberikan penghematan energi dan meningkatkan nilai

95% dari biaya siklus hidup pompa berhubungan dengan konsumsi energi listrik, pemeliharaan dan servis. Kenyataan ini seharusnya dipertimbangkan lebih dari hanya sekedar biaya investasi untuk pengadaan pompa hemat energi yang ada di pasaran. Potensi jangka panjangnya sangatlah berarti.





OPTIMISATION & CONSULTANCY

Tinjauan lanjutan penghematan energi

Apabila Anda tertarik untuk mencari lebih banyak peluang penghematan listrik pada pompa-pompa yang teridentifikasi, kami dapat mengusulkan beberapa tinjauan lanjutan, yaitu:

Pengukuran sesaat

Kami akan memasang alat pengukur selama beberapa jam untuk mengambil data sesaat (snap-shot) kinerja pompa.

Pengecekan kebutuhan vs suplai

Pengecekan ini akan menilai kinerja pompa-pompa yang ada apakah sudah sesuai dengan kebutuhan.

Pump Audit

Kami akan menggunakan beberapa peralatan khusus untuk mengukur profil beban pompa dalam waktu tertentu sesuai kesepakatan. Hasilnya adalah laporan detail beserta saran pengantiannya.

Lokasi : Pilot Plant (PUMP NO 1) Section : COMPRESSOR ROOM



Lokasi : Pilot Plant (PUMP NO 2) Section : COMPRESSOR ROOM



Lokasi : SDC (PUMP NO 1) Section : CHILLER ROOM



Lokasi : SDC (PUMP NO 2) Section : CHILLER ROOM



Lokasi : SDC (PUMP NO 3) Section : CHILLER ROOM



Lokasi : PP1 (PUMP NO 1) Section : COMPRESSOR ROOM



Lokasi : PP1 (PUMP NO 2) Section : COMPRESSOR ROOM



Lokasi : PP1 (PUMP NO 1) Section : COMPRESSOR ROOM



Lokasi : PP1 (PUMP NO 1) Section : Boiler Room 7 Ton



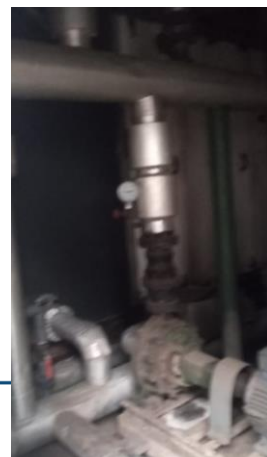
Lokasi : PP1 (PUMP NO 2) Section : Boiler Room 7 Ton



Lokasi : PP1 (PUMP NO 1) Section : Boiler Room 10 Ton



Lokasi : CP 1 (PUMP NO 1) Section : Air Fresh room



Lokasi : CP 1 (PUMP NO 2) Section : Air Fresh room



Lokasi : SPP 1 (PUMP NO 1) Section : Compressor room



Lokasi : SPP 1 (PUMP NO 2) Section : Compressor room



Lokasi : SPP 2 (PUMP NO 1) Section : Compressor room



Lokasi : SPP 2 (PUMP NO 2) Section : Compressor room



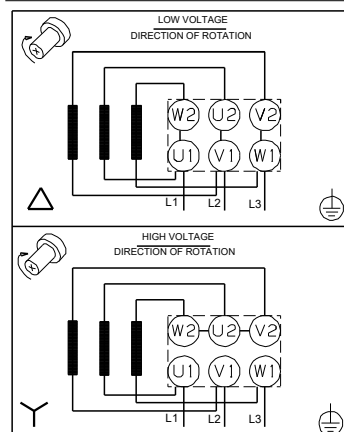
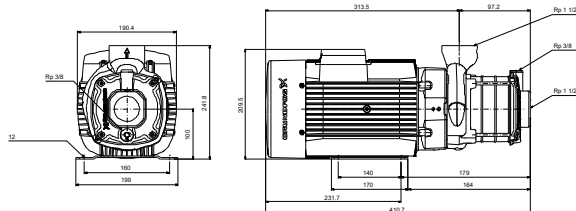
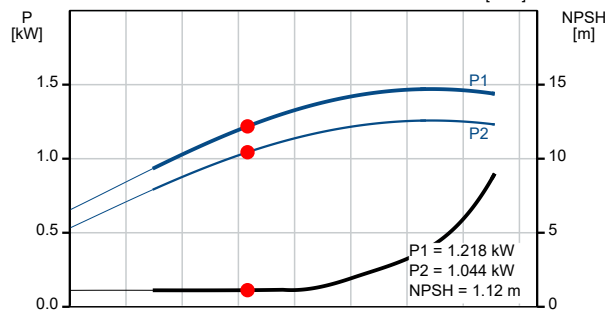
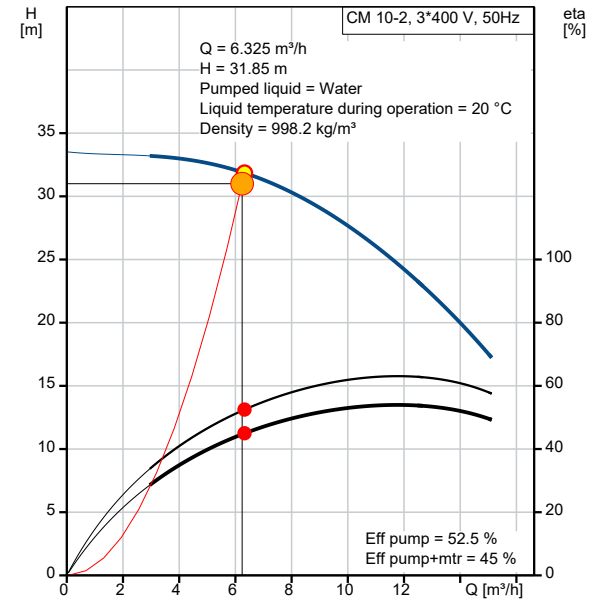
Lokasi : SPP 2 (PUMP NO 1) Section : Chiller Room



Lokasi : SPP 2 (PUMP NO 2) Section : Chiller Room



Description	Value
General information:	
Product name:	CM 10-2 A-R-A-E-AVBE F-A-A-N
Product No.:	98669754
EAN:	5711499295123
Price:	
Technical:	
Pump speed on which pump data are based:	2900 rpm
Actual calculated flow:	6.325 m ³ /h
Rated flow:	10 m ³ /h
Resulting head of the pump:	31.85 m
Rated head:	27.09 m
Impellers:	2
Code for shaft seal:	AVBE
Approvals:	CE, WRAS, ACS, EAC
Curve tolerance:	ISO9906:2012 3B
Pump version:	A
Model:	A
Materials:	
Pump housing:	Cast iron
Pump housing:	EN-GJL-200
Pump housing:	ASTM A48-25A
Impeller:	Stainless steel
Impeller:	EN 1.4301
Impeller:	AISI 304
Material code:	A
Code for rubber:	E
Installation:	
Range of ambient temperature:	-20 .. 55 °C
Maximum operating pressure:	10 bar
Max pressure at stated temperature:	10 bar / 40 °C
Max pressure at stated temperature:	6 bar / 90 °C
Type of connection:	Rp
Size of suction port:	1 1/2 inch
Size of outlet port:	1 1/2 inch
Outlet position:	12
Connect code:	R
Liquid:	
Pumped liquid:	Water
Liquid temperature range:	-20 .. 90 °C
Selected liquid temperature:	20 °C
Density:	998.2 kg/m ³
Kinematic viscosity:	1 mm ² /s
Electrical data:	
Motor standard:	IEC
Frame size:	90SD
IE efficiency class:	IE3
Rated power - P2:	1.5 kW
Main frequency:	50 Hz
Suitable for 50/60 Hz:	N
Phase:	3
Rated voltage:	220-240D/380-415Y V
Service factor:	1.00
Rated current:	5.70/3.30 A
Starting current:	710-790 %
Rated speed:	2890-2910 rpm
Enclosure class (IEC 34-5):	IP55
Insulation class (IEC 85):	F

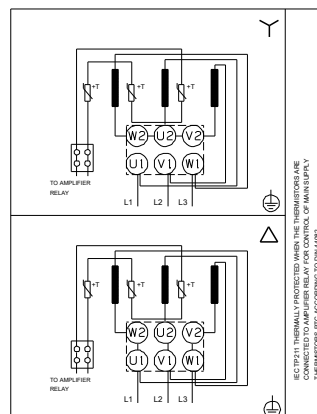
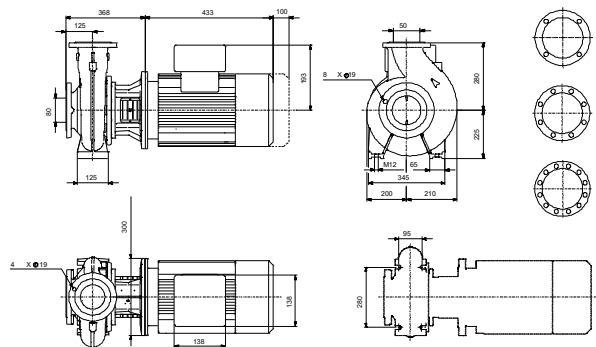
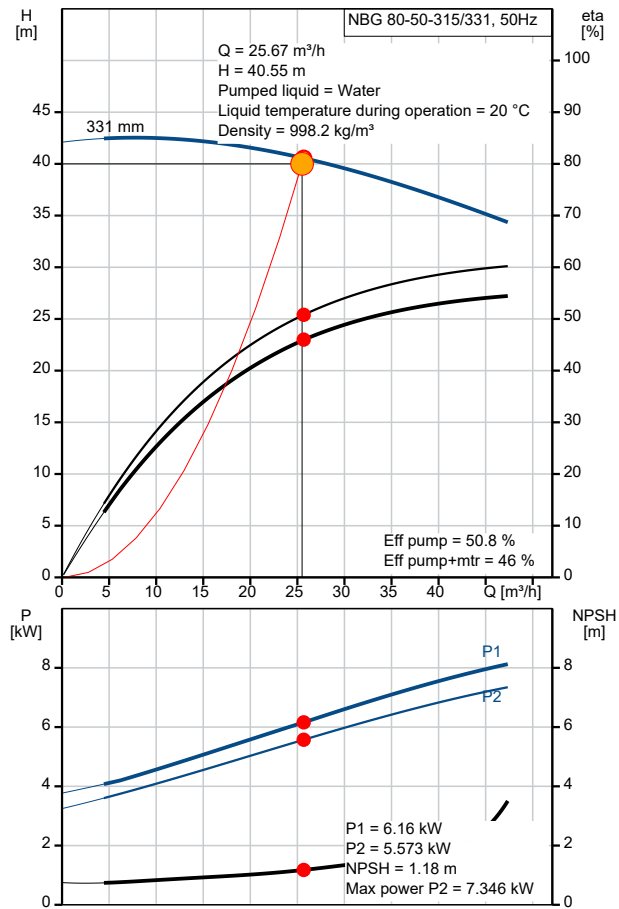




Company name: PT. Parfima Mekadaya
Created by: Fahrizal Dwi Choiri
Phone: 082257243394
Email: rizal@parfimameka.com
Date: 11/15/2021

Description	Value
Built-in motor protection:	NONE
Cable included (Yes/No):	N
Controls:	
Frequency converter:	NONE
Others:	
Terminal box position:	12
Minimum efficiency index, MEI \geq :	0.7
Net weight:	30.5 kg
Gross weight:	33 kg

Description	Value
General information:	
Product name:	NBG 80-50-315/331 AAF2KESBQQEMW3
Product No.:	99117812
EAN:	5712607098124
Price:	
Technical:	
Rated pump speed:	1460 rpm
Actual calculated flow:	25.67 m ³ /h
Resulting head of the pump:	40.55 m
Actual impeller diameter:	331 mm
Nominal impeller diameter:	315
Shaft seal arrangement:	Single
Shaft diameter:	32 mm
Code for shaft seal:	BQQE
Curve tolerance:	ISO9906:2012 3B2
Pump version:	A
Bearing design:	Standard
Max power P2 along the curve:	7.346 kW
Materials:	
Pump housing:	Stainless steel
Pump housing:	EN 1.4408
Pump housing:	ASTM CF8M
Wear ring:	Stainless steel
Flange:	Cast iron
Flange:	EN-GJS-500-7
Flange:	ASTM 70-50-05
Impeller:	Stainless steel
Impeller:	EN 1.4408
Impeller:	ASTM CF8M
Shaft:	Stainless steel
Shaft:	EN 1.4401
Shaft:	AISI 316
Internal pump house coating:	No coating
Material code:	K
Code for rubber:	E
Installation:	
t max amb:	60 °C
Maximum operating pressure:	16 bar
Pipe connection standard:	EN 1092-1
Size of inlet connection:	DN 80
Size of outlet connection:	DN 50
Pressure rating for connection:	PN 16
Bearing lubrication:	Grease
Pump housing with feet:	Yes
Pump support block (Yes/No):	N
Connect code:	F2
Liquid:	
Pumped liquid:	Water
Liquid temperature range:	-25 .. 120 °C
Selected liquid temperature:	20 °C
Density:	998.2 kg/m ³
Kinematic viscosity:	1 mm ² /s
Electrical data:	
Motor type:	132M
IE Efficiency class:	IE3
Rated power - P2:	7.5 kW
Main frequency:	50 Hz

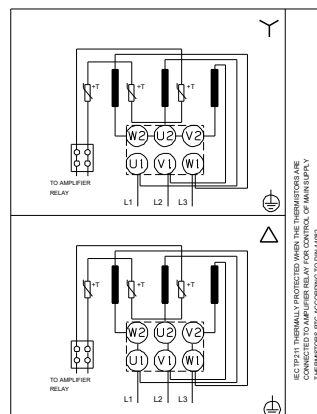
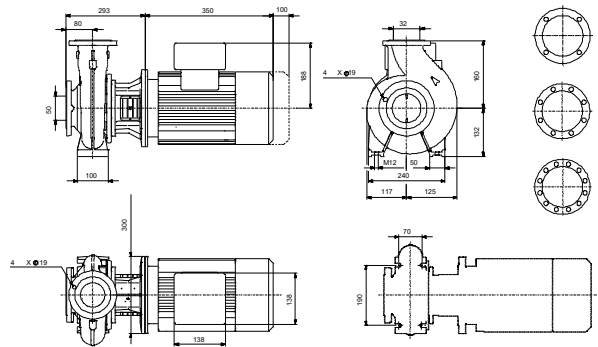
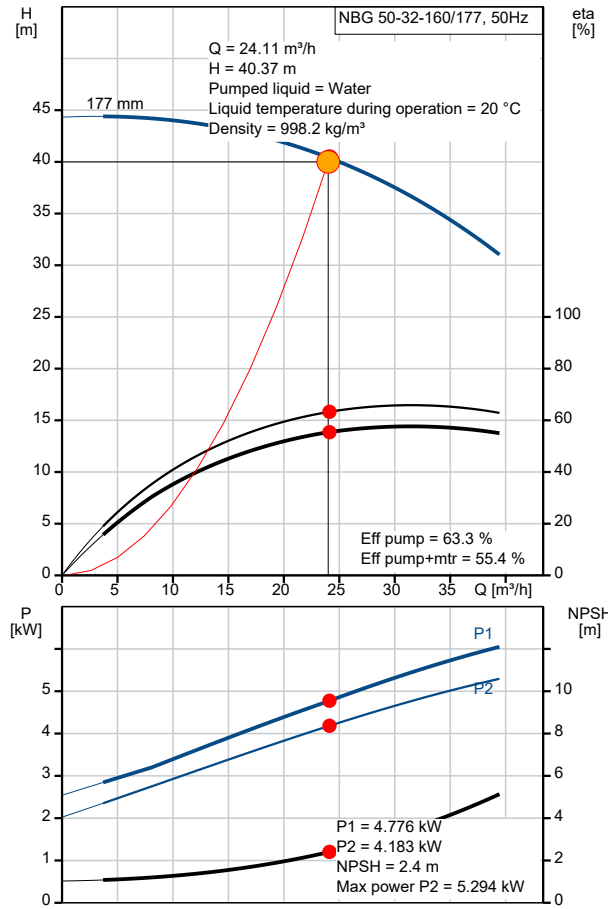




Company name: PT. Parfima Mekadaya
Created by: Fahrizal Dwi Choiri
Phone: 082257243394
Email: rizal@parfimameka.com
Date: 11/9/2021

Description	Value
Rated voltage:	3 x 380-415D/660-690Y V
Rated current:	15.4/8.85 A
Starting current:	856-820 %
Cos phi - power factor:	0.82
Rated speed:	1460 rpm
IE efficiency:	IE3 90,4%
Motor efficiency at full load:	90.4-90.4 %
Motor efficiency at 3/4 load:	90.5-90.5 %
Motor efficiency at 1/2 load:	89.3-89.3 %
Number of poles:	4
Enclosure class (IEC 34-5):	55 (Protect. water jets/dust)
Insulation class (IEC 85):	F
Built-in motor protection:	PTC
Motor Number:	99313172
Mounting design per IEC 34-7:	IM V1/B5
Controls:	
Frequency converter:	NONE
Pressure sensor:	N
Others:	
Minimum efficiency index, MEI \geq :	0.70
Net weight:	157 kg
Gross weight:	179 kg
Shipping volume:	0.509 m ³
Sales region:	CN

Description	Value
General information:	
Product name:	NBG 50-32-160/177 AAF2BESBAQELW1
Product No.:	97838125
EAN:	5710625501800
Price:	
Technical:	
Rated pump speed:	2930 rpm
Actual calculated flow:	24.11 m ³ /h
Resulting head of the pump:	40.37 m
Actual impeller diameter:	177 mm
Nominal impeller diameter:	160
Shaft seal arrangement:	Single
Shaft diameter:	24 mm
Code for shaft seal:	BAQE
Curve tolerance:	ISO9906:2012 3B2
Pump version:	A
Bearing design:	Standard
Max power P2 along the curve:	5.294 kW
Materials:	
Pump housing:	Cast iron
Pump housing:	EN-GJL-250
Pump housing:	ASTM class 35
Wear ring:	Brass
Impeller:	Bronze
Impeller:	CuSn10-C
Shaft:	Stainless steel
Shaft:	EN 1.4301
Shaft:	AISI 304
Internal pump house coating:	CED
Material code:	B
Code for rubber:	E
Installation:	
t max amb:	60 °C
Maximum operating pressure:	16 bar
Pipe connection standard:	EN 1092-2
Size of inlet connection:	DN 50
Size of outlet connection:	DN 32
Pressure rating for connection:	PN 16
Bearing lubrication:	Grease
Pump housing with feet:	Yes
Pump support block (Yes/No):	N
Connect code:	F2
Liquid:	
Pumped liquid:	Water
Liquid temperature range:	0 .. 120 °C
Selected liquid temperature:	20 °C
Density:	998.2 kg/m ³
Kinematic viscosity:	1 mm ² /s
Electrical data:	
Motor type:	132SA
IE Efficiency class:	IE2
Rated power - P2:	5.5 kW
Main frequency:	50 Hz
Rated voltage:	3 x 380-420D/660-725Y V
Rated current:	10,8-9,70/6,20-5,60 A
Starting current:	850-850 %
Cos phi - power factor:	0.9

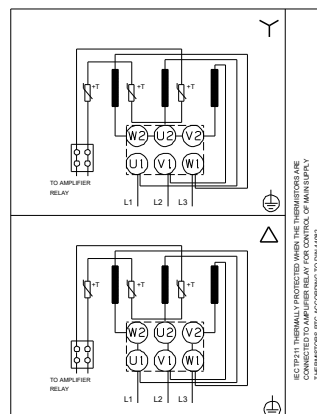
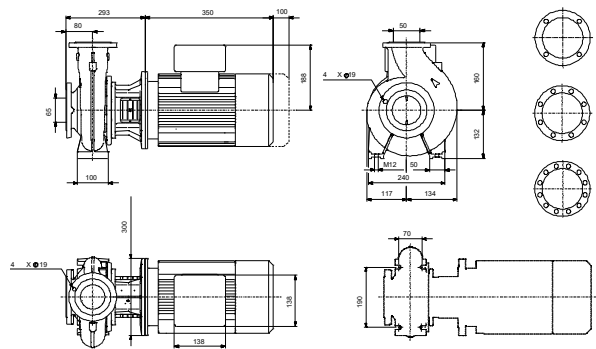
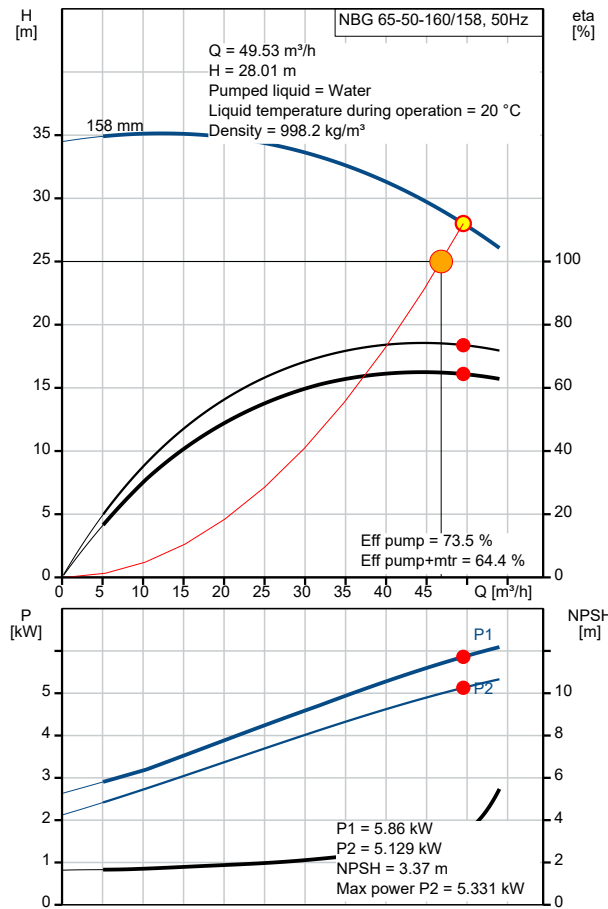




Company name: PT. Parfima Mekadaya
Created by: Fahrizal Dwi Choiri
Phone: 082257243394
Email: rizal@parfimameka.com
Date: 11/15/2021

Description	Value
Rated speed:	2930 rpm
IE efficiency:	IE2 87,5%
Motor efficiency at full load:	87.5-87.5 %
Motor efficiency at 3/4 load:	87.6-87.6 %
Motor efficiency at 1/2 load:	86.0-86.0 %
Number of poles:	2
Enclosure class (IEC 34-5):	55 (Protect. water jets/dust)
Insulation class (IEC 85):	F
Built-in motor protection:	PTC
Motor Number:	83K15217
Mounting design per IEC 34-7:	IM B5
Controls:	
Frequency converter:	NONE
Pressure sensor:	N
Others:	
Minimum efficiency index, MEI \geq :	0.59
Net weight:	75 kg
Gross weight:	92 kg
Shipping volume:	0.315 m ³

Description	Value
General information:	
Product name:	NBG 65-50-160/158 AAF2BESBAQELW1
Product No.:	97838140
EAN:	5710625501954
Price:	
Technical:	
Rated pump speed:	2930 rpm
Actual calculated flow:	49.53 m ³ /h
Resulting head of the pump:	28.01 m
Actual impeller diameter:	158 mm
Nominal impeller diameter:	160
Shaft seal arrangement:	Single
Shaft diameter:	24 mm
Code for shaft seal:	BAQE
Curve tolerance:	ISO9906:2012 3B2
Pump version:	A
Bearing design:	Standard
Max power P2 along the curve:	5.331 kW
Materials:	
Pump housing:	Cast iron
Pump housing:	EN-GJL-250
Pump housing:	ASTM class 35
Wear ring:	Brass
Impeller:	Bronze
Impeller:	CuSn10-C
Shaft:	Stainless steel
Shaft:	EN 1.4301
Shaft:	AISI 304
Internal pump house coating:	CED
Material code:	B
Code for rubber:	E
Installation:	
t max amb:	60 °C
Maximum operating pressure:	16 bar
Pipe connection standard:	EN 1092-2
Size of inlet connection:	DN 65
Size of outlet connection:	DN 50
Pressure rating for connection:	PN 16
Bearing lubrication:	Grease
Pump housing with feet:	Yes
Pump support block (Yes/No):	N
Connect code:	F2
Liquid:	
Pumped liquid:	Water
Liquid temperature range:	0 .. 120 °C
Selected liquid temperature:	20 °C
Density:	998.2 kg/m ³
Kinematic viscosity:	1 mm ² /s
Electrical data:	
Motor type:	132SA
IE Efficiency class:	IE2
Rated power - P2:	5.5 kW
Main frequency:	50 Hz
Rated voltage:	3 x 380-420D/660-725Y V
Rated current:	10,8-9,70/6,20-5,60 A
Starting current:	850-850 %
Cos phi - power factor:	0.9

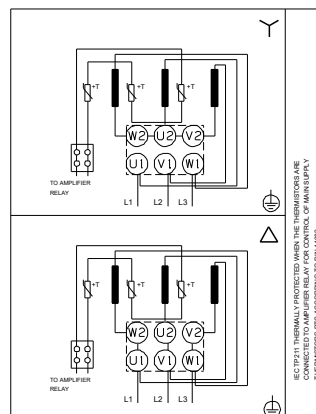
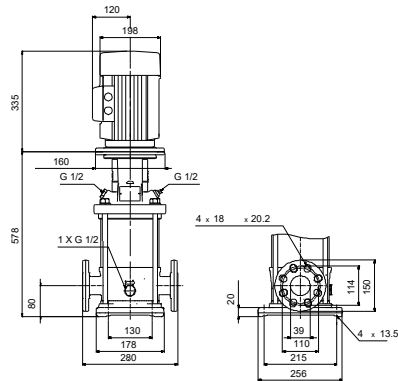
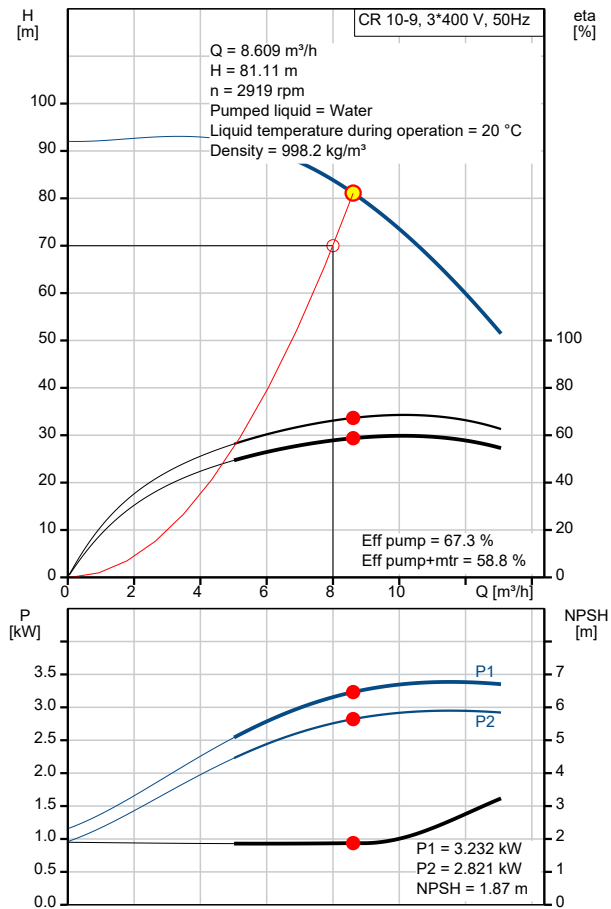




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Created by: Fahrizal Dwi Choiri
Phone: 082257243394
Email: rizal@parfimameka.com
Date: 11/15/2021

Description	Value
Rated speed:	2930 rpm
IE efficiency:	IE2 87,5%
Motor efficiency at full load:	87.5-87.5 %
Motor efficiency at 3/4 load:	87.6-87.6 %
Motor efficiency at 1/2 load:	86.0-86.0 %
Number of poles:	2
Enclosure class (IEC 34-5):	55 (Protect. water jets/dust)
Insulation class (IEC 85):	F
Built-in motor protection:	PTC
Motor Number:	83K15217
Mounting design per IEC 34-7:	IM B5
Controls:	
Frequency converter:	NONE
Pressure sensor:	N
Others:	
Minimum efficiency index, MEI ≥:	0.70
Net weight:	76 kg
Gross weight:	93 kg
Shipping volume:	0.315 m ³

Description	Value
General information:	
Product name:	CR 10-9 A-FJ-A-E-HQQE
Product No.:	96500971
EAN:	5700396212777
Price:	
Technical:	
Rated pump speed:	2902 rpm
Actual calculated flow:	8.609 m ³ /h
Resulting head of the pump:	81.11 m
Maximum head:	91.8 m
Stages:	9
Impellers:	9
Number of reduced-diameter impellers:	0
Low NPSH:	N
Pump orientation:	Vertical
Shaft seal arrangement:	Single
Code for shaft seal:	HQQE
Approvals:	CE,EAC,UKCA
Approvals for drinking water:	WRAS,ACS
Curve tolerance:	ISO9906:2012 3B
Pump version:	A
Model:	A
Materials:	
Base:	Cast iron
Base:	EN 1561 EN-GJL-200
Base:	ASTM A48-25B
Impeller:	Stainless steel
Impeller:	EN 1.4301
Impeller:	AISI 304
Material code:	A
Code for rubber:	E
Bearing:	SIC
Installation:	
t max amb:	60 °C
Maximum operating pressure:	16 bar
Max pressure at stated temperature:	16 bar / 120 °C
Max pressure at stated temperature:	16 bar / -20 °C
Type of connection:	DIN / JIS
Size of inlet connection:	DN 40
Size of outlet connection:	DN 40
Pressure rating for connection:	PN 25
Flange rating inlet:	300 lb
Flange size for motor:	FT130
Connect code:	FJ
Liquid:	
Pumped liquid:	Water
Liquid temperature range:	-20 .. 120 °C
Selected liquid temperature:	20 °C
Density:	998.2 kg/m ³
Electrical data:	
Motor standard:	IEC
Motor type:	100LC
IE Efficiency class:	IE3
Rated power - P2:	3 kW
Power (P2) required by pump:	3 kW
Main frequency:	50 Hz
Rated voltage:	3 x 220-240D/380-415Y V

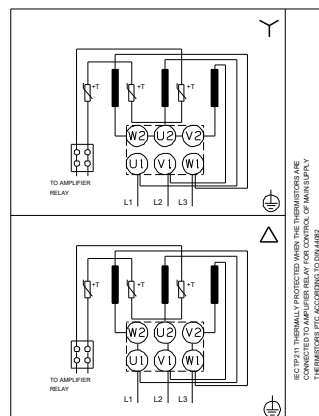
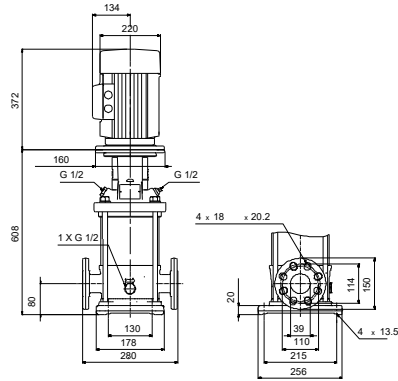
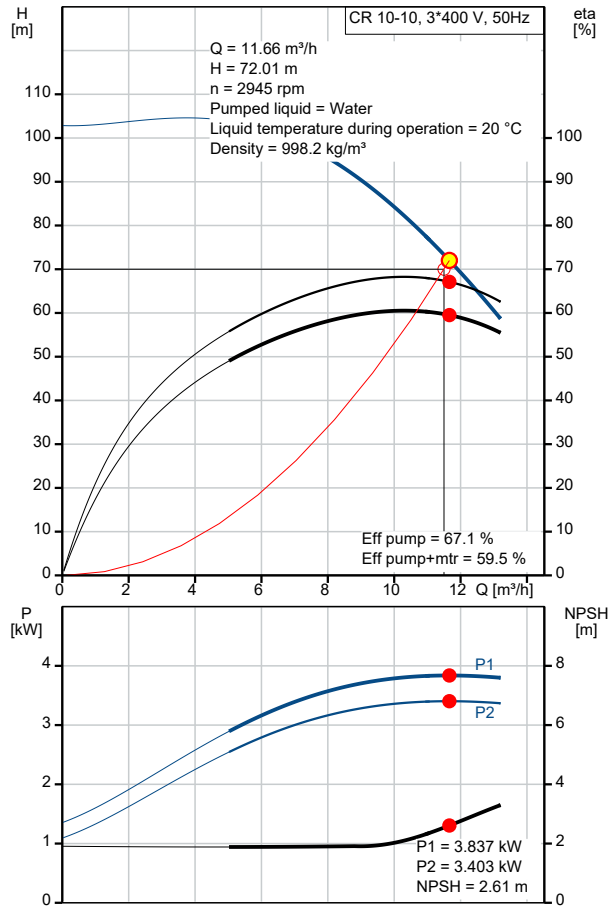




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Phone: 082257243394
Email: rizal@parfimameka.com
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Description	Value
Rated current:	11.0/6.30 A
Starting current:	840-920 %
Cos phi - power factor:	0.87-0.82
Rated speed:	2900-2920 rpm
IE efficiency:	IE3 87,1%
Motor efficiency at full load:	87.1 %
Motor efficiency at 3/4 load:	88.0 %
Motor efficiency at 1/2 load:	87.7 %
Number of poles:	2
Enclosure class (IEC 34-5):	55 Dust/Jetting
Insulation class (IEC 85):	F
Built-in motor protection:	PTC
Motor Number:	85U05510
Controls:	
Frequency converter:	NONE
Others:	
Minimum efficiency index, MEI \geq :	0.70
Net weight:	61 kg
Gross weight:	65 kg
Shipping volume:	0.13 m ³

Description	Value
General information:	
Product name:	CR 10-10 A-FJ-A-E-HQQE
Product No.:	96500972
EAN:	5700396212791
Price:	
Technical:	
Rated pump speed:	2917 rpm
Actual calculated flow:	11.66 m ³ /h
Resulting head of the pump:	72.01 m
Maximum head:	102 m
Stages:	10
Impellers:	10
Number of reduced-diameter impellers:	0
Low NPSH:	N
Pump orientation:	Vertical
Shaft seal arrangement:	Single
Code for shaft seal:	HQQE
Approvals:	CE,EAC,UKCA
Approvals for drinking water:	WRAS,ACS
Curve tolerance:	ISO9906:2012 3B
Pump version:	A
Model:	A
Materials:	
Base:	Cast iron
Base:	EN 1561 EN-GJL-200
Base:	ASTM A48-25B
Impeller:	Stainless steel
Impeller:	EN 1.4301
Impeller:	AISI 304
Material code:	A
Code for rubber:	E
Bearing:	SIC
Installation:	
t max amb:	60 °C
Maximum operating pressure:	16 bar
Max pressure at stated temperature:	16 bar / 120 °C
Max pressure at stated temperature:	16 bar / -20 °C
Type of connection:	DIN / JIS
Size of inlet connection:	DN 40
Size of outlet connection:	DN 40
Pressure rating for connection:	PN 25
Flange rating inlet:	300 lb
Flange size for motor:	FT130
Connect code:	FJ
Liquid:	
Pumped liquid:	Water
Liquid temperature range:	-20 .. 120 °C
Selected liquid temperature:	20 °C
Density:	998.2 kg/m ³
Electrical data:	
Motor standard:	IEC
Motor type:	112MC
IE Efficiency class:	IE3
Rated power - P2:	4 kW
Power (P2) required by pump:	4 kW
Main frequency:	50 Hz
Rated voltage:	3 x 220-240D/380-415Y V

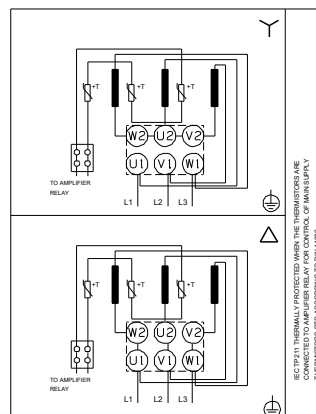
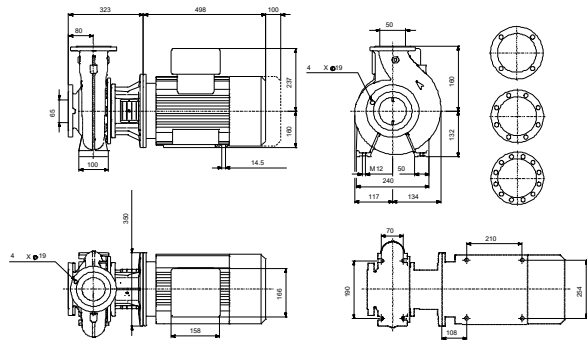
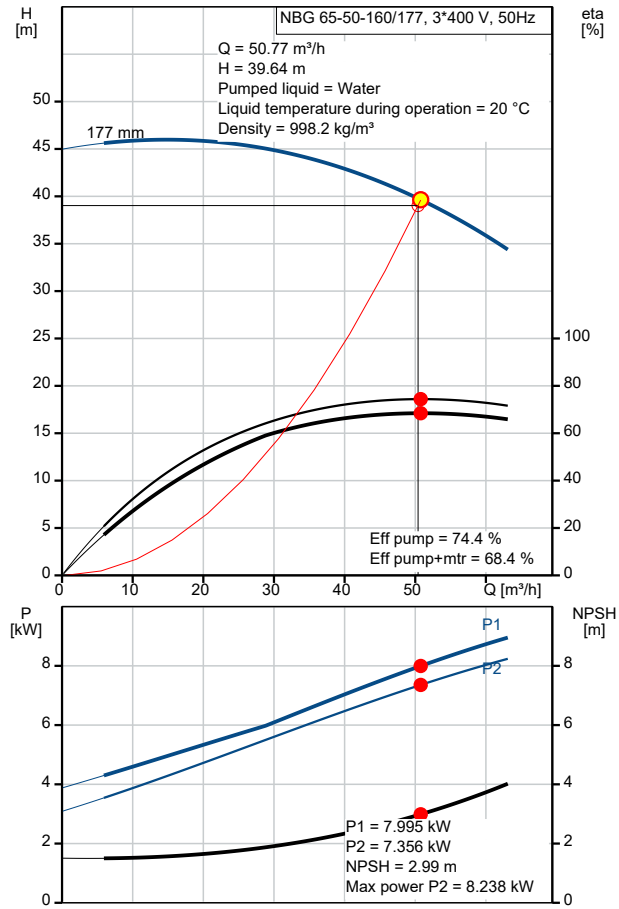




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Phone: 082257243394
Email: rizal@parfimameka.com
Date: 11/30/2021

Description	Value
Rated current:	13.6/7.90 A
Starting current:	1000-1110 %
Cos phi - power factor:	0.87-0.87
Rated speed:	2920-2940 rpm
IE efficiency:	IE3 88,1%
Motor efficiency at full load:	88.1 %
Motor efficiency at 3/4 load:	88.6 %
Motor efficiency at 1/2 load:	85.2 %
Number of poles:	2
Enclosure class (IEC 34-5):	55 Dust/Jetting
Insulation class (IEC 85):	F
Built-in motor protection:	PTC
Motor Number:	85U05413
Controls:	
Frequency converter:	NONE
Others:	
Minimum efficiency index, MEI \geq :	0.70
Net weight:	74 kg
Gross weight:	77 kg
Shipping volume:	0.13 m ³

Description	Value
General information:	
Product name:	NBG 65-50-160/177 AAF2BESBQQENW1
Product No.:	96703914
EAN:	5700837567268
Price:	
Technical:	
Rated pump speed:	2935 rpm
Actual calculated flow:	50.77 m ³ /h
Resulting head of the pump:	39.64 m
Actual impeller diameter:	177 mm
Nominal impeller diameter:	160
Shaft seal arrangement:	Single
Shaft diameter:	24 mm
Code for shaft seal:	BQQE
Curve tolerance:	ISO9906:2012 3B
Pump version:	A
Bearing design:	Standard
Max power P2 along the curve:	8.238 kW
Materials:	
Pump housing:	Cast iron
Pump housing:	EN-GJL-250
Pump housing:	ASTM class 35
Wear ring:	Brass
Impeller:	Brass
Impeller:	CuZn37Pb
Shaft:	Stainless steel
Shaft:	EN 1.4301
Shaft:	AISI 304
Internal pump house coating:	CED
Material code:	B
Code for rubber:	E
Installation:	
t max amb:	40 °C
Maximum operating pressure:	16 bar
Pipe connection standard:	EN 1092-2
Size of inlet connection:	DN 65
Size of outlet connection:	DN 50
Pressure rating for connection:	PN 16
Bearing lubrication:	Grease
Pump housing with feet:	Yes
Support block (Yes/No):	N
Connect code:	F2
Liquid:	
Pumped liquid:	Water
Liquid temperature range:	-25 .. 120 °C
Selected liquid temperature:	20 °C
Density:	998.2 kg/m ³
Electrical data:	
Motor type:	160M
IE Efficiency class:	IE3
Rated power - P2:	11 kW
Main frequency:	50 Hz
Rated voltage:	3 x 380-420D/660Y V
Rated current:	20,36-18,4/11,7 A
Starting current:	765-765 %
Cos phi - power factor:	0.90
Rated speed:	2935 rpm

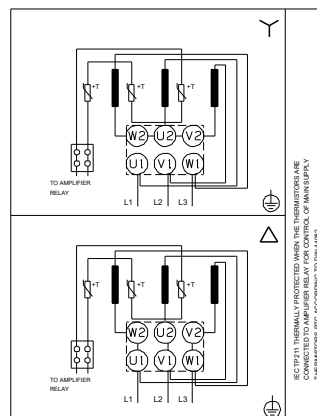
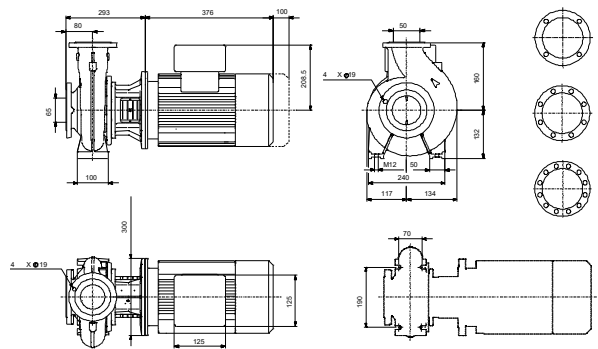
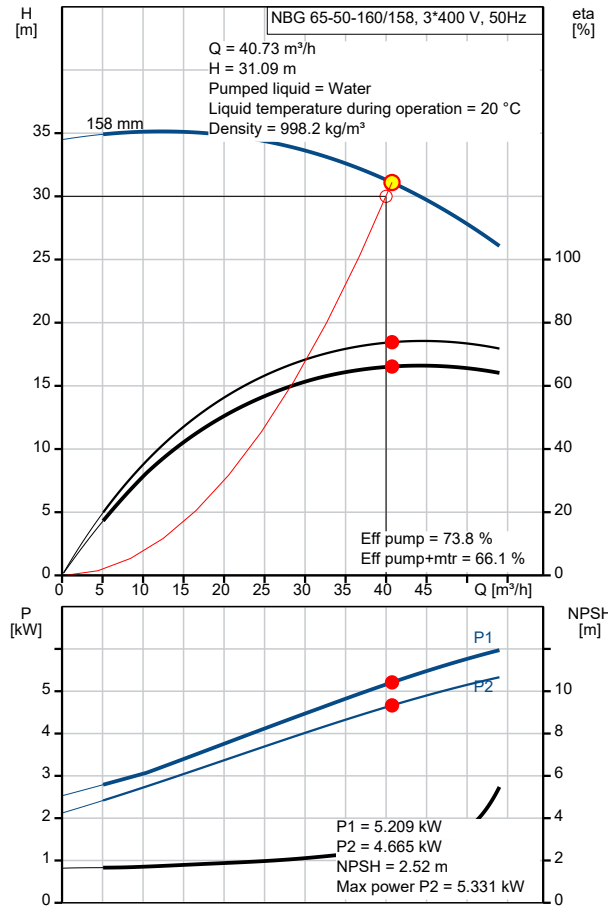




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Phone: 082257243394
Email: rizal@parfimameka.com
Date: 11/30/2021

Description	Value
IE efficiency:	IE3 91,2%
Motor efficiency at full load:	91.2-91.2 %
Motor efficiency at 3/4 load:	92.0-92.0 %
Motor efficiency at 1/2 load:	92.0-92.0 %
Number of poles:	2
Enclosure class (IEC 34-5):	55 (Protect. water jets/dust)
Insulation class (IEC 85):	F
Built-in motor protection:	PTC
Motor Number:	99490101
Mounting design per IEC 34-7:	IM B35
Controls:	
Frequency converter:	NONE
Pressure sensor:	N
Others:	
Minimum efficiency index, MEI ≥:	0.70
Net weight:	173 kg
Gross weight:	194 kg
Shipping volume:	0.509 m ³
Sales region:	South Asia

Description	Value
General information:	
Product name:	NBG 65-50-160/158 AAF2BESBQQELW1
Product No.:	96703912
EAN:	5700837567220
Price:	
Technical:	
Rated pump speed:	2930 rpm
Actual calculated flow:	40.73 m ³ /h
Resulting head of the pump:	31.09 m
Actual impeller diameter:	158 mm
Nominal impeller diameter:	160
Shaft seal arrangement:	Single
Shaft diameter:	24 mm
Code for shaft seal:	BQQE
Curve tolerance:	ISO9906:2012 3B2
Pump version:	A
Bearing design:	Standard
Max power P2 along the curve:	5.331 kW
Materials:	
Pump housing:	Cast iron
Pump housing:	EN-GJL-250
Pump housing:	ASTM class 35
Wear ring:	Brass
Impeller:	Brass
Impeller:	CuZn37Pb
Shaft:	Stainless steel
Shaft:	EN 1.4301
Shaft:	AISI 304
Internal pump house coating:	CED
Material code:	B
Code for rubber:	E
Installation:	
t max amb:	40 °C
Maximum operating pressure:	16 bar
Pipe connection standard:	EN 1092-2
Size of inlet connection:	DN 65
Size of outlet connection:	DN 50
Pressure rating for connection:	PN 16
Bearing lubrication:	Grease
Pump housing with feet:	Yes
Support block (Yes/No):	N
Connect code:	F2
Liquid:	
Pumped liquid:	Water
Liquid temperature range:	-25 .. 120 °C
Selected liquid temperature:	20 °C
Density:	998.2 kg/m ³
Electrical data:	
Motor type:	132S
IE Efficiency class:	IE3
Rated power - P2:	5.5 kW
Main frequency:	50 Hz
Rated voltage:	3 x 380-420D/660Y V
Rated current:	10,89-9,86/6,27 A
Starting current:	777-777 %
Cos phi - power factor:	0.86
Rated speed:	2930 rpm

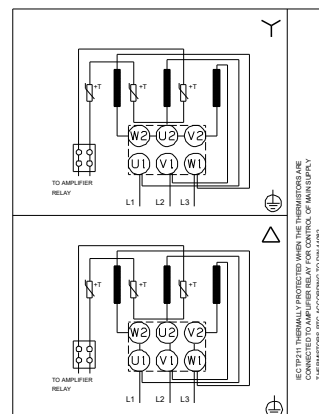
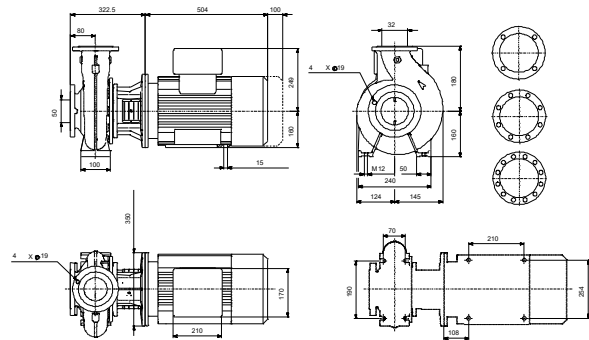
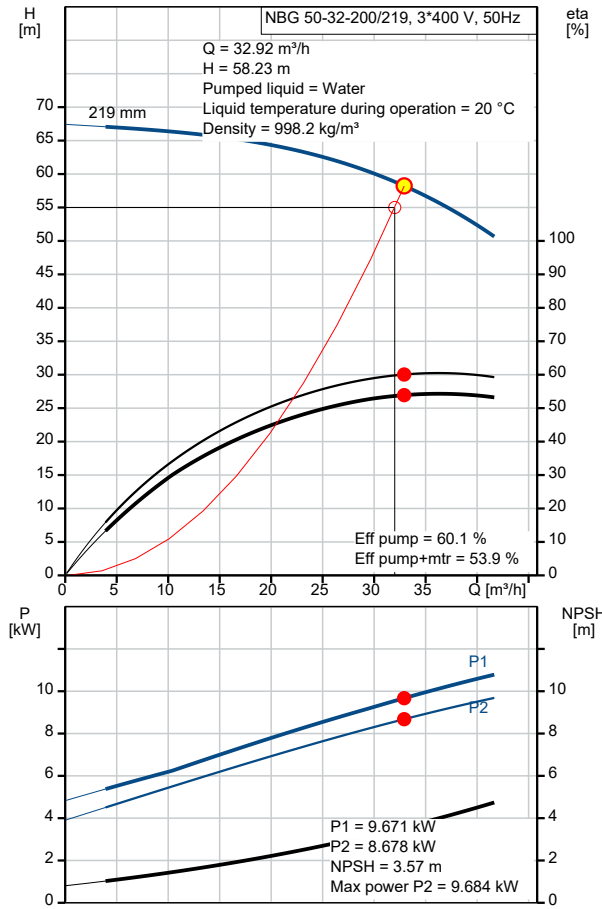




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Created by: Fahrizal Dwi Choiri
Phone: 082257243394
Email: rizal@parfimameka.com
Date: 11/30/2021

Description	Value
IE efficiency:	IE3 89,2%
Motor efficiency at full load:	89.2-89.2 %
Motor efficiency at 3/4 load:	89.8-89.8 %
Motor efficiency at 1/2 load:	89.5-89.5 %
Number of poles:	2
Enclosure class (IEC 34-5):	55 (Protect. water jets/dust)
Insulation class (IEC 85):	F
Built-in motor protection:	PTC
Motor Number:	99490021
Mounting design per IEC 34-7:	IM V1
Controls:	
Frequency converter:	NONE
Pressure sensor:	N
Others:	
Minimum efficiency index, MEI ≥:	0.70
Net weight:	109 kg
Gross weight:	126 kg
Shipping volume:	0.315 m ³
Sales region:	South Asia

Description	Value
General information:	
Product name:	NBG 50-32-200/219 AAF2BESBAQENW1
Product No.:	97838129
EAN:	5710625501848
Price:	
Technical:	
Rated pump speed:	2940 rpm
Actual calculated flow:	32.92 m ³ /h
Resulting head of the pump:	58.23 m
Actual impeller diameter:	219 mm
Nominal impeller diameter:	200
Shaft seal arrangement:	Single
Shaft diameter:	24 mm
Code for shaft seal:	BAQE
Curve tolerance:	ISO9906:2012 3B
Pump version:	A
Bearing design:	Standard
Max power P2 along the curve:	9.684 kW
Materials:	
Pump housing:	Cast iron
Pump housing:	EN-GJL-250
Pump housing:	ASTM class 35
Wear ring:	Brass
Impeller:	Bronze
Impeller:	CuSn10-C
Shaft:	Stainless steel
Shaft:	EN 1.4301
Shaft:	AISI 304
Internal pump house coating:	CED
Material code:	B
Code for rubber:	E
Installation:	
t max amb:	60 °C
Maximum operating pressure:	16 bar
Pipe connection standard:	EN 1092-2
Size of inlet connection:	DN 50
Size of outlet connection:	DN 32
Pressure rating for connection:	PN 16
Bearing lubrication:	Grease
Pump housing with feet:	Yes
Support block (Yes/No):	N
Connect code:	F2
Liquid:	
Pumped liquid:	Water
Liquid temperature range:	0 .. 120 °C
Selected liquid temperature:	20 °C
Density:	998.2 kg/m ³
Electrical data:	
Motor type:	160MA
IE Efficiency class:	IE2
Rated power - P2:	11 kW
Main frequency:	50 Hz
Rated voltage:	3 x 380-420D/660-725Y V
Rated current:	20,6-18,6/11,8-10,8 A
Starting current:	750-750 %
Cos phi - power factor:	0.9
Rated speed:	2940 rpm





Company name: PT. Parfima Mekadaya
Created by: Fahrizal Dwi Choiri
Phone: 082257243394
Email: rizal@parfimameka.com
Date: 11/30/2021

Description	Value
IE efficiency:	IE2 89,9%
Motor efficiency at full load:	89.9-89.9 %
Motor efficiency at 3/4 load:	89.7-89.7 %
Motor efficiency at 1/2 load:	88.1-88.1 %
Number of poles:	2
Enclosure class (IEC 34-5):	55 (Protect. water jets/dust)
Insulation class (IEC 85):	F
Built-in motor protection:	PTC
Motor Number:	83K15424
Mounting design per IEC 34-7:	IM B35
Controls:	
Frequency converter:	NONE
Pressure sensor:	N
Others:	
Minimum efficiency index, MEI \geq :	0.68
Net weight:	155 kg
Gross weight:	176 kg
Shipping volume:	0.509 m ³