



Ref. #: RBW604497.1 rev1

The revitorizontal Rolls Emphateinents statiother usage purpose Model: ascentaining 4x 92 nf 95 mancemp Withor the plier: Armstrong choice) general design concept. This review shall not mean the detail retention the rentification of the renti approveb; are sponsibility of which shall remain with Representative: Walmar Limited Nepean, Ontario the Confractor with mitting and review shall not Phone number: e-mail: renebueneman@walmar.net relieve the Contractor of this responsibility for errors omission: in the shop drawings or his Submitted by: Rene Bueneman responsibility at four designed and all requirements of the Contract Documents. The Contractor is responsible Pipe orientation: Single Suction pressure: for dimensions to be confirmed and correlated at the Fluid: PropyleneGlycol:50 site, Quantity: information that pertains solely Operating temperature: 60 F fabrication of the fabrication o to_{77 U}techniques Viscosity: 49.45 SSU construction and installation and for co-ordination of Specific gravity: 1.0416 the work of all some traides. 0 ppm JRP Englinate etails of construction Construction Impeller: Bronze (B584-844) M. Karakolis Pump shaft: Carbon Steel Connections Shaft sleeve: 304 SS DATE: May 10th, 2017 Casing (volute): Flexible coupling: Rotex Bearings: Casing gasket: Confined Non-Asbestos Fiber Anti-Friction Grease Lubricated Mechanical seal data Seal type: Inside Single Spring Rotating face: Sintered Silicon Carbide Manufacturer code: SSCssc L EPSS 2A Stationary seat: Sintered Silicon Carbide Secondary seal: Stainless Steel **EPDM** Springs: Rotating hardware: Stainless Steel Motor electrical data Insulation class: Class F Insulation Supplier: **Factory Choice** Size: Inverter Duty 15 hp Inverter motor type: Frame number: 254TC Efficiency: NEMA Prem (12.12) Enclosure: ODP Speed: 1770 rpm Motor Electrics: 575/3/60

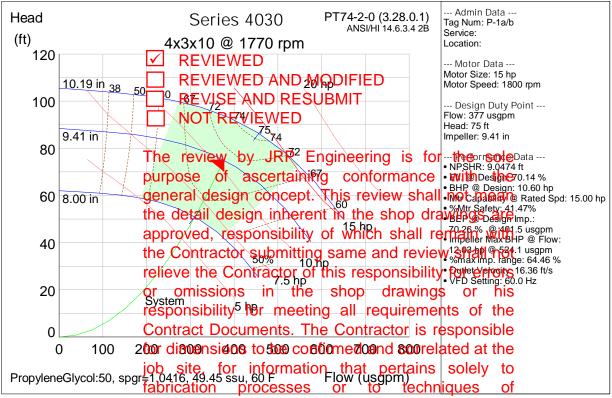
Maximum pressure:

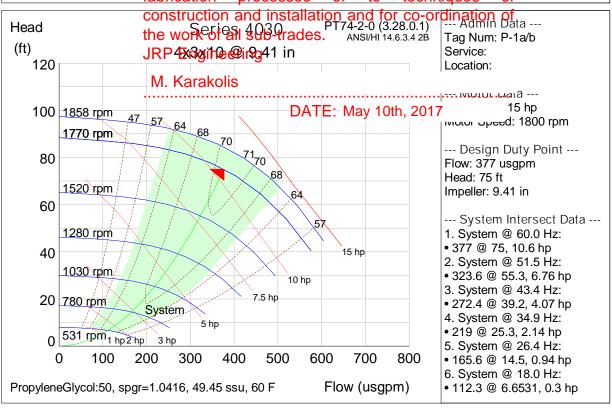
Operating limits (temperature - pressure)

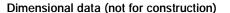


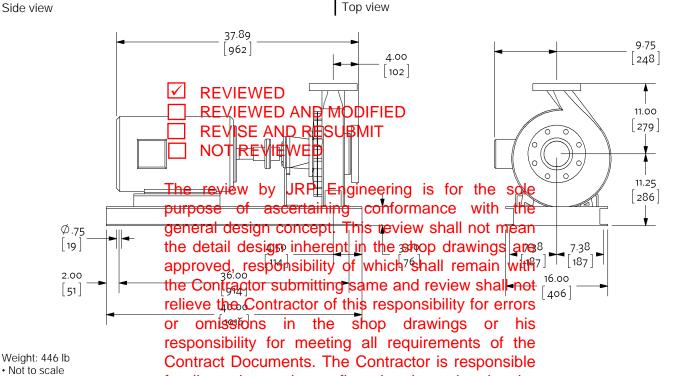
Maximum temperature. 250 F Pumpicas Mgs are hydrostatically test Mechanical Solution OPTIMUM Mechanical Solutions num pump working pr TOMLINSON 84 Bentley Avenue, Ottawa, Ontario K2E 679 Ph: 613-228-9500 Fax: 613-228-9218 ✓ APPROVED REJECTED REVISE REVIEWED **BY CARL MUIR** 4/12/2017 f. # RBW604497 1 rev1 1 of 39 SPEC PUMPS

175 psi









Weight: 446 lb

- · Units of measure: inches [millimateris]dimensions to be confirmed and correlated at the
- Tolerance of ± 0.125 inch (± 3 mm) should be used information that pertains solely to For certified dimensions, please domact your Armstrong representative
- Pump equipped with casing drainfally rich light NPD rections of substance gates portechniques

the work of all sub-trades.

construction and installation and for co-ordination of

Connection details

Connection	SizeJRP	nain eeir ina	OD	Bolt quantity*	BCD	Bolt size
Inlet	4	ANSI-125	9	8	7.5	0.625
Outlet	3 M. K	arakolis			6	0.625

^{*}Equally spaced straddling centreline

DATE: May 10th, 2017

Special instructions

The program has defaulted to a NEMA Premium Efficiency motor supplied with NEMA MG-1 Part 31.4.4.2 insulation standards for inverter-fed polyphase motors.

Selected options

Couplings-Rotex

Additional equipment

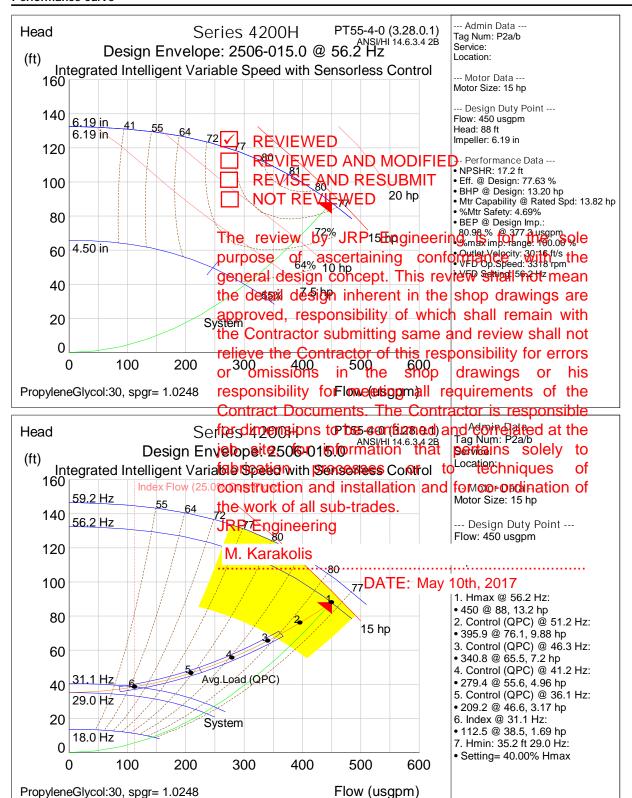
Flotrex: FTV-4FS (570200-378) Suction Guide: SG-44 (516860-021)



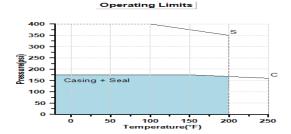
Design envelope horizontal base mounted end suction pump					
Model: Series Design Env	relope sories 4200H 250 REVIEWED AN)6-015.0 ID MODIFIED			
Project name: Tomlinson Pu	mps REVISE AND R	RESUBMIT			
Location:	NOT REVIEWE	Representative: Walmar Limit	ed Nepean, Ontario		
Date submitted: 3/31/2017		Phone number:	ou Nopour, Ornario		
Engineer:	The review by IRI	Pe-nangineering religible for the material control of the control	shewsole at		
_	· · · · · · · · · · · · · · · · · · ·	•			
Contractor: purpose of ascertasioning of Gonformange math the Application design data general design concept. This review shall not mean					
Application design data					
Tag number:		erentrimathe shop draw	<u> </u>		
Service:		Ilityction profision shall rem			
Location:		ittlivig same and review			
Quantity:	² relieve the Contracto	Operating temperature:	or errors		
Duty flow per pump:	450 USgpm .	Viscosity: the	36.98 SSU		
Duty head:	8811	Specific gravity.	of the		
Environment:		esting faeth, requirements			
Total dissolved solids:	o Contract Documents	1	•		
Materials of construction		confirmed and correlate			
Construction:	^{Br} job site, for inforn	า <mark>สตัอฟ^{er:}that pertains s</mark>	○^{Refy}ze (B 584-844)		
Rating:	ANSIDIZECTION proces	ses of technique	ues ASTM A276 Type 416		
Connections:	Inlet: 3 in Outlet: 2.5 in	Flush line:	Braided Stainless Steel		
Casing (volute): Casing (volute): Cash (volu					
Mechanical seal data	IDD Existing solitons	aues.			
Seal type:	Outside Balanced	Rotating face:	Resin Bonded Carbon		
Manufacturer code:	^{C-S} M. Karakolis	•	ilicon Carbide		
Springs:	Stainless Steel	1	···Viton····		
Rotating hardware:	Stainless Steel	DATE: May 10th, 2017	_		
Motor electrical data		•			
Supplier:	Factory Choice	Insulation class:	Class F Insulation		
Size:	15 hp	Inverter motor type:	Inverter Duty		
Frame number:	254TC	Efficiency:	NEMA Prem (12.12)		
Enclosure:	TEFC	Operating speed @ 100% flow:	3318 rpm		
Motor Electrics:	575/3/60	Operating speed @ 50% flow:	2194 rpm		
		1 ' 3 '	•		
IVS102 controller data					
Sensorless control:	Yes-Quadratic press control	Communication port:	RS 485		
BMS protocol:	BACnet Native	Analog inputs:	2 (current or voltage)		
Enclosure:	UL Type 12	Analog outputs:	1 (current)		
Fused disconnect switch:	No	Digital inputs:	4 (programmable)		
Control orientation:	STD	Digital outputs:	2 (programmable)		
Expansion card:	None	Cooling:	Fan cooled through back channel		
BHP at 50% load/flow and 55% of design head:	3.3 hp	Ambient temperature:	14F to 113F (up to 3280ft elevation)		
Meets ASHRAE 90.1:	Yes	EMI/RFI control:	Integrated fliter to meet EN61800-3		
Min. maintained sys. pressure:	35.2 ft	Harmonic suppression:	Integrated DC link reactor**		

^{*}If minimum maintained system pressure is not known, default is 40% of design head.

^{**} The IVS 102 control is a low harmonic control with a built-in DC link reactor equivalent in performance to a 5% AC line reactor. This does not guarantee performance to any system wide harmonic specification or the costs to meet a system wide specification. If supplied with the system electrical details, Armstrong will run a computer simulation of the system wide harmonics. If system harmonic levels are exceeded, Armstrong can also recommend additional harmonic mitigation and the cost for such mitigation.



Operating limits (temperature - pressure)



Maximum pressure: 175 psi
Maximum temperature: 200 F

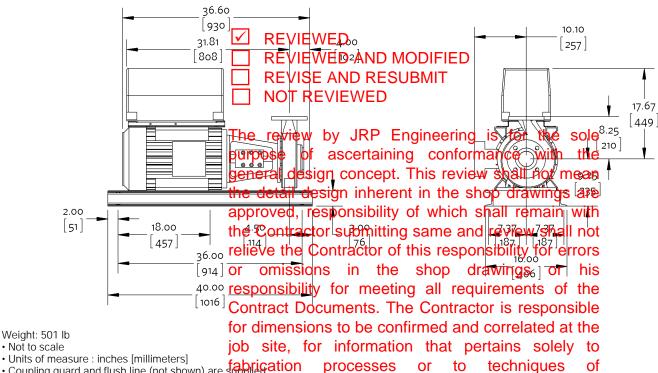
Pump casings are hydrostatically tested to 150% of maximum pump working pressure rating.

Design envelope pumping unit capability

Operating point	Flow	Head	Efficiency
Full capability at 100% design flow	450 USgpm	94.7 ft	78.53 %
Design point	450 USgpm	88 ft	77.63 %
50% average flow (with default load profile)	225 usgpm	48.5 ft	80.25 %

Dimensional data (not for construction)

Side view Top view



Weight: 501 lb · Not to scale

- Coupling guard and flush line (not shown) are sabrication • Tolerance of ± 0.125 inch (± 3 mm) should be weenstruction and installation and for co-ordination of
- For certified dimensions, please contact your Armstrong representative Pump equipped with casing drain plug and ¼ interest and distribution and distributio

JRP Engineering

Connection details

M. Karakolis

Connection	Size	Rating	OD DAT	Politiciantific		Bolt size
Inlet	3	ANSI-125	7.5 DAT	E: May 10th, 20	J17	0.625
Outlet	2.5	ANSI-125	7	4	5.5	0.625

^{*}Equally spaced straddling centreline

Special instructions

The program has defaulted to a NEMA Premium Efficiency motor supplied with NEMA MG-1 Part 31.4.4.2 insulation standards for inverter-fed polyphase motors.

UL STD 778 & CSA STD C22.2 no.108 certified

Selected options

Environmental Application: Indoors

Additional equipment

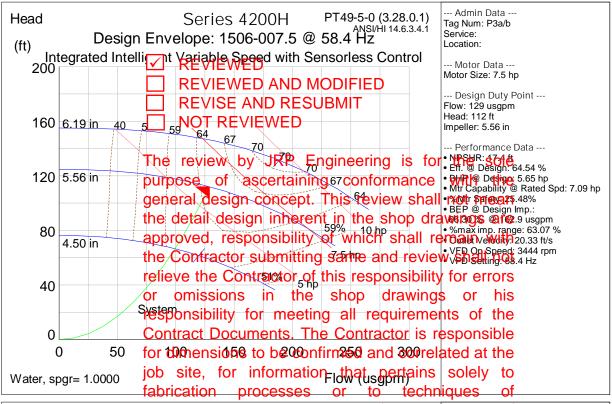
Flotrex: FTV-4FA (570200-478) Suction Guide: SG-33 (516860-019)

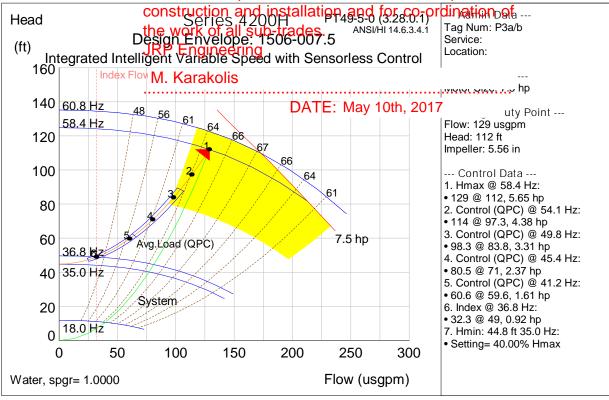


Design envelope hori	z Mal Base Hotelied end REVIEWED AND N verne Sensates 4200 H 150	suction pump				
	REVIEWED AND I	MODIFIED				
Model: Series Design En	verne Revise AND RES	(UBMI)T				
Project name: Tomlinson F	NOT REVIEWED					
Location:		Representative: Walmar Limite	ed Nepean, Ontario			
Date submitted: 3/31/2017	The review by JRP E	ingipeering is for the	sole			
Engineer:	purpose of ascertaining	ag _{hail} conformance	ind Namar.net			
Contractor:	general design concept. This review shall not mean					
the detail design inherent in the shop drawings are						
Application design data Tag number:	approved, responsibility	· · ·				
Service:	the Contractor submitting					
Location:	relieve the Contractor or	<u> </u>				
Quantity:	or omissions in the	Operating temperature: or	6hte			
Duty flow per pump:		Viscosity:	31, SSU			
Duty head:	responsibility for meeti	n <mark>g all requirements o</mark> Specific gravity: Specific gravity: is respon	1,0000			
Environment:	Contract Documents. The Contract Documents.	le Contractor is respondant	nsible			
Total dissolved solids:	for dimensions to be cor	ifirmed and correlated a	at the			
Materials of construction	job site, for information	on that pertains sole	ly to			
Construction:	fabrication processes	Impatier: to techniques	Bro o‡ e (B584-844)			
Rating:	construction and installa	tଝାନ୍ଧନ୍ୟ for co-ordinati	OSSASTM A276 Type 416			
Connections:	the work of all sinb-trade	Flush line:	Braided Stainless Steel			
Casing (volute):	JRP Engineering	Casing gasket:	Confined Non-Asbestos Fiber			
Mechanical seal data	orti Engineening					
Seal type:	M. Karakolis		Bonded Carbon			
Manufacturer code:	C-SSC AB2	Stationani seat:	Sinfered Silicon Carbide			
Springs:	Stainless Steel DA	TE May 10th, 2017	'n			
Rotating hardware:	Stainless Steel					
Motor electrical data						
Supplier:	Factory Choice	Insulation class:	Class F Insulation			
Size:	7.5 hp	Inverter motor type:	Inverter Duty			
Frame number:	213TC	Efficiency:	NEMA Prem (12.12)			
Enclosure:	TEFC	Operating speed @ 100% flow:	3444 rpm			
Motor Electrics:	575/3/60	Operating speed @ 50% flow:	2476 rpm			
IVS102 controller data						
Sensorless control:	Yes-Quadratic press control	Communication port:	RS 485			
BMS protocol:	BACnet Native	Analog inputs:	2 (current or voltage)			
Enclosure:	UL Type 12	Analog outputs:	1 (current)			
Fused disconnect switch:	No	Digital inputs:	4 (programmable)			
Control orientation:	STD	Digital outputs:	2 (programmable)			
Expansion card:	None	Cooling:	Fan cooled through back channel			
BHP at 50% load/flow and 55% of design head:	1.41 hp	Ambient temperature:	14F to 113F (up to 3280ft elevation)			
Meets ASHRAE 90.1:	No	EMI/RFI control:	Integrated fliter to meet EN61800-3			
Min. maintained sys. pressure:	44.8 ft	Harmonic suppression:	Integrated DC link reactor**			
416 1 1 1 1 1 1						

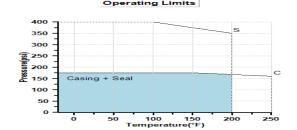
^{*}If minimum maintained system pressure is not known, default is 40% of design head.

^{**} The IVS 102 control is a low harmonic control with a built-in DC link reactor equivalent in performance to a 5% AC line reactor. This does not guarantee performance to any system wide harmonic specification or the costs to meet a system wide specification. If supplied with the system electrical details, Armstrong will run a computer simulation of the system wide harmonics. If system harmonic levels are exceeded, Armstrong can also recommend additional harmonic mitigation and the cost for such mitigation.





Operating limits (temperature - pressure)



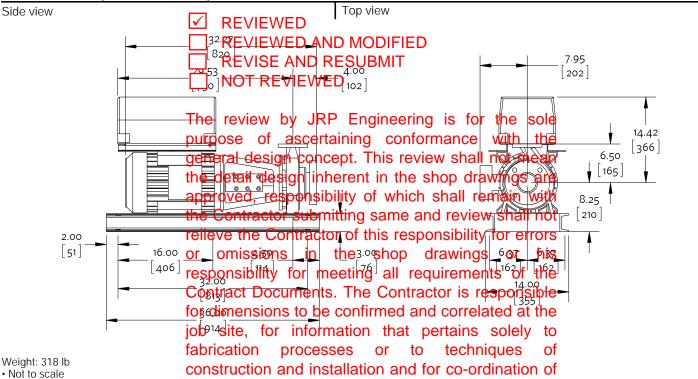
Maximum pressure: 175 psi
Maximum temperature: 200 F

Pump casings are hydrostatically tested to 150% of maximum pump working pressure rating.

Design envelope pumping unit capability

Operating point	Flow	Head	Efficiency
Full capability at 100% design flow	129 USgpm	122.7 ft	63.97 %
Design point	129 USgpm	112 ft	64.54 %
50% average flow (with default load profile)	64.5 usgpm	61.7 ft	57.69 %

Dimensional data (not for construction)



Units of measure: inches [millimetersthe work of all sub-trades.
 Coupling guard and flush line (not shown) are supplied
 Tolerance of ± 0.125 inch (± 3 mm) should be a sub-trade incering

· For certified dimensions, please contact your Armstrong representative

Pump equipped with casing drain plug M. Karakolis

DATE: May 10th, 2017

Connection details

	Connection	Size	Rating	OD	Bolt quantity*	BCD	Bolt size
	Inlet	3	ANSI-125	7.5	4	6	0.625
	Outlet	1.5	ANSI-125	5	4	3.88	0.5

^{*}Equally spaced straddling centreline

Special instructions

The program has defaulted to a NEMA Premium Efficiency motor supplied with NEMA MG-1 Part 31.4.4.2 insulation standards for inverter-fed polyphase motors.

UL STD 778 & CSA STD C22.2 no.108 certified

Selected options

Environmental Application: Indoors

Additional equipment

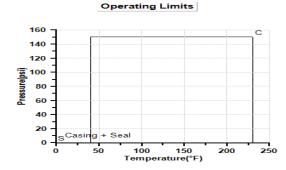
Flotrex: FTV-3FA (570200-477) Suction Guide: SG-33 (516860-019)



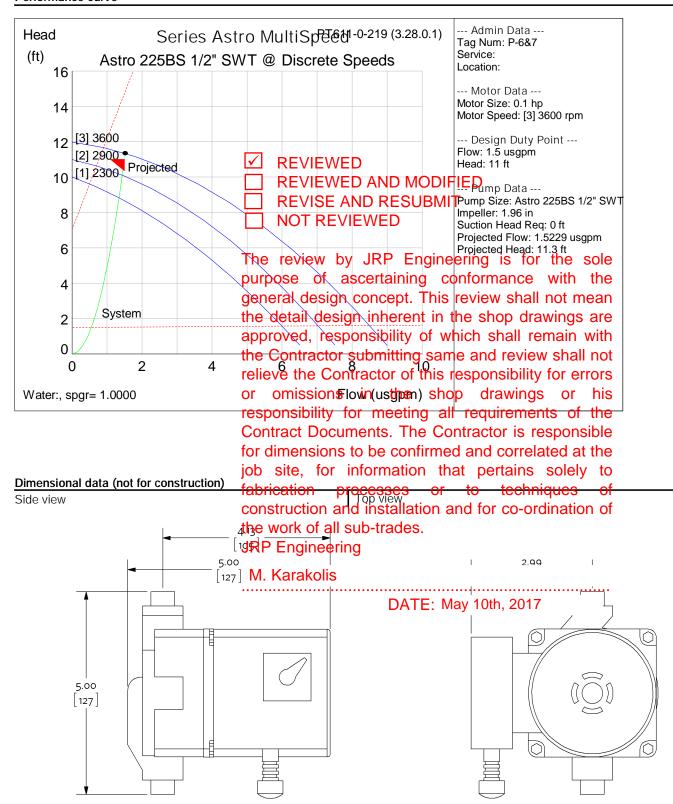
Ref. #: RBW604497.1 rev1

Wet rotor circulator		
Model: Series ASTRO 225	BS 1/2" SWT REVIEWED	Part number: 110223-303
Project name: Tomlinson Pui	mps REVIEWED	AND MODIFIED
Location:	REVISE AND	Represente Malmar Limited Nepean, Ontario
Date submitted: 3/31/2017	☐ NOT REVIEV	<mark>թիշի</mark> number։
Engineer:	_	e-mail: renebueneman@walmar.net
Contractor:	The review by .	Manufectorineering Asentor the sole
Application design data	•	ertaining conformance with the
Tag number:		ntieptienthis: review shall intermean
Service:	the detail design	nyelieneshirthe shop drawings are
Location:	approved respon	Sibility of which shall remain with
Quantity:	2 the Contractor cul	Operating temperature: 60 F
Duty flow per pump:		britting same and review shall not
Duty head:		ctor_af dhisy responsibility for errors
Total dissolved solids:	_{0 ppm} or omissions in	the shop drawings or his
Materials of construction	responsibility for	meeting all requirements of the
Construction:		ntspellehe Contractor is respensible (PEI)
Connections:		bଞ୍ଜେମ୍ଫୋମ୍ଫାଲed and correlated st the
Connection type:	NPSM union site, for info	
Companion flange:	Not required proc	Listing: .ETL listed for US and Canada esses or to techniques of
	•	nstallation and for co-ordination of
Motor electrical data	the work of all sub	o-trades.
Supplier:	Factory Choice Engineering	Insulation class: Not applicable
Size:	0.41	insulation class.
Frame number:	Nataruis	
Enclosure:	ODP	Sp ₽ATE : May 10th, 2017
Motor Electrics:	115/1/60	

Operating limits (temperature - pressure)



Maximum pressure: 150 psi
Maximum temperature: 230 F



Weight: 7 lb

- Not to scale
- Units of measure : inches [millimeters]
- Tolerance of ± 0.125 inch (± 3 mm) should be used
- For certified dimensions, please contact your Armstrong representative

\checkmark	REVIEWED
	REVIEWED AND MODIFIED
	REVISE AND RESUBMIT
	NOT REVIEWED

The review by JRP Engineering is for the sole purpose of ascertaining conformance with the general design concept. This review shall not mean the detail design inherent in the shop drawings are approved, responsibility of which shall remain with the Contractor submitting same and review shall not relieve the Contractor of this responsibility for errors or omissions in the shop drawings or his responsibility for meeting all requirements of the Contract Documents. The Contractor is responsible for dimensions to be confirmed and correlated at the job site, for information that pertains solely to fabrication processes or to techniques of construction and installation and for co-ordination of the work of all sub-trades.

JRP Engineering

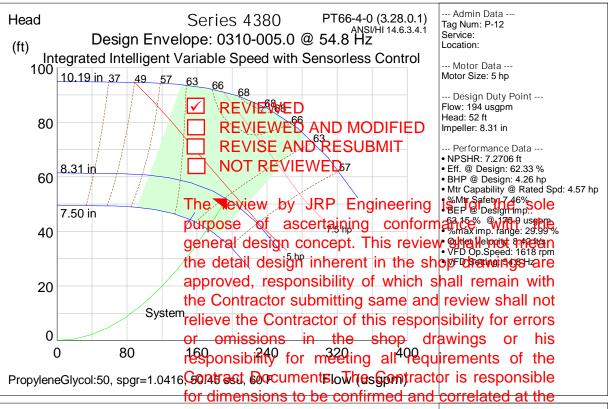
M. Karakolis		
	DATE: May 10th 2017	•••

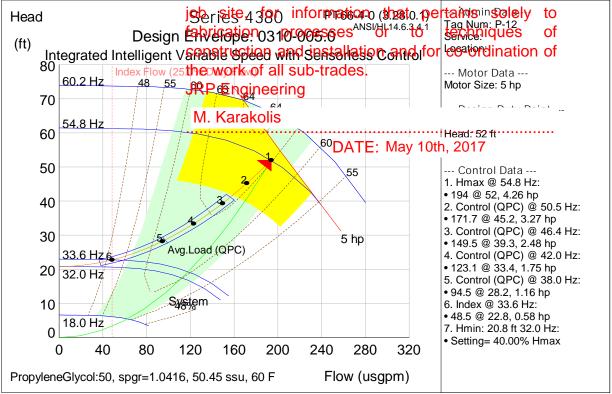


Design envelope close the purple of the pump reviewed and modified						
Model: Series Design En	REVIEWED AND N verne Sensodess 4380 0310 REVISE AND RES	AODIFIED UBMIT				
Project name: Tomlinson F	NOT REVIEWED					
Location:	·	Representative: Walmar Limite	ed Nepean, Ontario			
Date submitted: 3/31/2017	The review by JRP E	· ·	·			
Engineer:	purpose of ascertaini	agnailconformance but with	ına <mark>t Nər</mark> mar.net			
Contractor:	general design concept					
Application design data the detail design inherent in the shop drawings are						
Tag number:	approved, responsibility					
Service:	the Contractor submittin	•				
Location:	relieve the Contractor or					
Quantity:	or ¹ omissions in the	Operating temperature: or	6hts			
Duty flow per pump:	194 USapm :::	Viscosity:	5 <u>0.45</u> SSU			
Duty head:	responsibility for meeti	ng all fedulfements o Specific gravity: .	f_the 1.0416			
Environment:	Contract Documents. T	ne Contractor is respor	nsible			
Total dissolved solids:	for dimensions to be cor					
Materials of construction	job site, for information	on that pertains sole	ly to			
Construction:	fabrication processes	Impatier: to techniques	Bropre (BS1400 Grade LG1)			
Rating:	construction and installa	tਿor co-ordinati				
Connections:	theletinink Outletili in ub-trade	Casing gasket:	Confined Non-Asbestos Fiber			
Casing (volute):	JRP Engineering	Flush line:	Braided Stainless Steel			
Mechanical seal data	JRP Engineering	•				
Seal type:	M. Karakolis		ed Silicon Carbide			
Manufacturer code:	SSCssc L EPSS 2A	Stationary seat:	Sinfered Silicon Carbide			
Springs:	Stainless Steel DA	TE: May 10th, 2017	MC			
Rotating hardware:	Stainless Steel					
Motor electrical data		•				
Supplier:	Factory Choice	Insulation class:	Class F Insulation			
Size:	5 hp	Inverter motor type:	Inverter Duty			
Frame number:	184JM	Efficiency:	NEMA Prem (12.12)			
Enclosure:	TEFC	Operating speed @ 100% flow:	1618 rpm			
Motor Electrics:	575/3/60	Operating speed @ 50% flow:	1130 rpm			
IVS102 controller data						
Sensorless control:	Yes-Quadratic press control	Communication port:	RS 485			
BMS protocol:	BACnet Native	Analog inputs:	2 (current or voltage)			
Enclosure:	UL Type 12	Analog outputs:	1 (current)			
Fused disconnect switch:	No	Digital inputs:	4 (programmable)			
Control orientation:	L1	Digital outputs:	2 (programmable)			
Expansion card:	None	Cooling:	Fan cooled through back channel			
BHP at 50% load/flow and 55% of design head:	1.06 hp	Ambient temperature:	14F to 113F (up to 3280ft elevation)			
Meets ASHRAE 90.1:	Yes	EMI/RFI control:	Integrated fliter to meet EN61800-3			
Min. maintained sys. pressure:	20.8 ft	Harmonic suppression:	Integrated DC link reactor**			

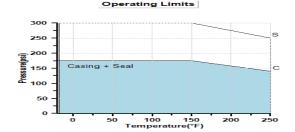
^{*}If minimum maintained system pressure is not known, default is 40% of design head.

^{**} The IVS 102 control is a low harmonic control with a built-in DC link reactor equivalent in performance to a 5% AC line reactor. This does not guarantee performance to any system wide harmonic specification or the costs to meet a system wide specification. If supplied with the system electrical details, Armstrong will run a computer simulation of the system wide harmonics. If system harmonic levels are exceeded, Armstrong can also recommend additional harmonic mitigation and the cost for such mitigation.





Operating limits (temperature - pressure)



Maximum pressure: 175 psi
Maximum temperature: 250 F

Pump casings are hydrostatically tested to 150% of maximum pump working pressure rating.

Design envelope pumping unit capability

Operating point	Flow	Head	Efficiency
Full capability at 100% design flow	194 USgpm	58.4 ft	63.09 %
Design point	194 USgpm	52 ft	62.33 %
50% average flow (with default load profile)	97 usgpm	28.6 ft	60.55 %

Dimensional data (not for construction)

Top view Side view R: 4.00 REVIEWED [102] REVIEWED AND MODIFIED 21.00 EVISE AND RESUBM#T 533 (ΩT REVIEWED review by & RP Engineering is 20.01 of ascertaining conformance 508 design concept. This review shall n 11.56 detail design inherent in the shop drawing 294 approved, responsibility of which shall remain with e Contractor submitting same and review shall not 14.53 relieve the Contractor of this responsibility 369 in sthe shop drawings responsibility for meeting all requirements of the 292 Contract Documents. The Contractor is responsible for dimensions to be confirmed and correlated at the

Weight: 379 lb · Not to scale

fabrication processes R = minimum lifting clearance required above metruction and installation and for co-ordination of

• Units of measure : inches [millimeters]

· Coupling guard and flush line (not shown) the upport of all sub-trades.

Tolerance of ± 0.125 inch (± 3 mm) should be used a june ring.
 For certified dimensions, please contact your Armstrong represendative

Pump equipped with casing drain plug and 1/2 inch MDT suction and discharge gauge ports

M. Karakolis

Connection details

Connection actains			<u></u>	<u></u>		
Connection	Size	Rating	DATE: May 10th, 201		סטט	Bolt size
Inlet	3	ANSI-125	7.5	4	6	0.625
Outlet	3	ANSI-125	7.5	4	6	0.625

job site, for information that pertains solely to

or to

techniques

Special instructions

The program has defaulted to a NEMA Premium Efficiency motor supplied with NEMA MG-1 Part 31.4.4.2 insulation standards for inverter-fed polyphase motors.

OSHPD Seismic Certification OSP-0422-10 UL STD 778 & CSA STD C22.2 no.108 certified

Selected options

Environmental Application: Indoors

Additional equipment

Flotrex: FTV-3FA (570200-477) Suction Guide: SG-33 (516860-019)

^{*}Equally spaced straddling centreline



Ref. #: RBW604497.1 rev1

Design envelope clos Model: Series Design En	•					
Project name: Tomlinson F Location: Date submitted: 3/31/2017 Engineer:	Pumps			TOPAMONIO TOPAMONIO	Т	ed Nepean, Ontario n@walmar.net
Contractor:					Rene Buenem	nan
Application design data		The	review b	y JRP Engine	erina is	for the sole
Tag number:	Alt. P-9		ose of a	scientinhin co		
Service:			eral design	Suction pressure:		hall not mean
Location:		<u> </u>	· · · · · · · · · ·	Fluid:		PropyleneGlycol:50
Quantity:	1	uic	uetaii uesi	operating temperatu	re:	do Funda in with
Duty flow per pump:				oonsibility of w		
Duty head:	47 ft			submittingysam		
Environment:	Indoors	relie	eve the Co	tsaretoncof thisa	responsil	oidity for errors
Total dissolved solids:	0 ppm	or	omissions	in the sho	p draw	ings or his
Materials of construction		resp	onsibility		L require	ments of the
Construction:	BF	-Con	tract Docu	ments. The Co	ntractor	Bronze (B\$1400 Grade LG1)
Rating:	ANSI-125			Shaft sleeve:	d and co	316 SS rrelated at the
Connections:	Inlet: 3 in,	Outlet:	dimensions	Casing gasket:		Confined Non-Asbestos Fiber
Casing (volute):	Cast Iron		₂ श्रिक् ₂₀₎ for	intermation the		Psaid Sold Mes Steel
Mechanical seal data				rocesses or		chniques of
Seal type:	Inside Sin	g ြေ မြော	struction a	1 danstallation a	ind for co	- Shellasilen etrbide
Manufacturer code:	SSCssc L	ethes'	work of all	subitradesi:		Sintered Silicon Carbide
Springs:	Stainless	SteRP	² Engineeri	n § econdary seal:		EPDM
Rotating hardware:	Stainless	Steel		ľ		
Motor electrical data		M.	Karakolis			
Supplier:	Factory C	hoice		Insulation Alass: M	av 10th 3	2017
Size:	5 hp	10100		Inverter motor type:	ay Tolli, 2	Inverter Duty
Frame number:	184JM			Efficiency:		NEMA Prem (12.12)
Enclosure:	TEFC			Operating speed @ 1	100% flow:	1504 rpm
Motor Electrics:	575/3/60			Operating speed @ 5		1068 rpm
				1 - 1 - 1 - 1 - 1		, , , , , , , , , , , , , , , , , , , ,
IVS102 controller data						
Sensorless control:	Yes-Quad	dratic pi	ress control	Communication port:		RS 485
BMS protocol:	BACnet N			Analog inputs:		2 (current or voltage)
Enclosure:	UL Type 1			Analog outputs:		1 (current)
Fused disconnect switch:	No No			Digital inputs:		4 (programmable)
Control orientation:	L1			Digital imputs:		2 (programmable)
Expansion card:	None			Cooling:		Fan cooled through back channel
BHP at 50% load/flow and 55% of design head:	0.82 hp			Ambient temperature) :	14F to 113F (up to 3280ft elevation)
Meets ASHRAE 90.1:	Yes			EMI/RFI control:		Integrated fliter to meet EN61800-3

18.8 ft

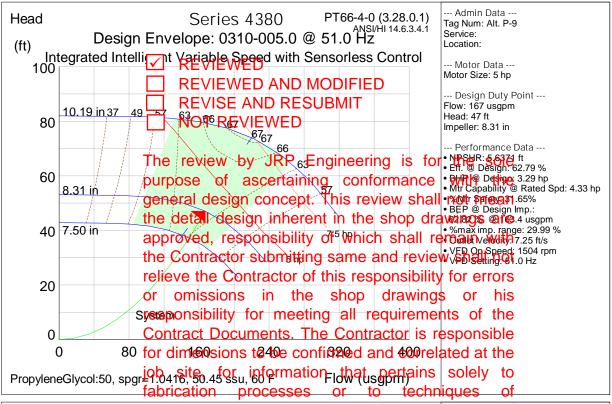
Min. maintained sys. pressure:

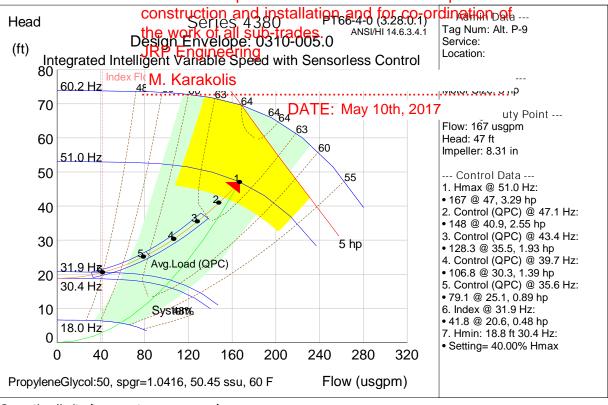
Harmonic suppression:

Integrated DC link reactor**

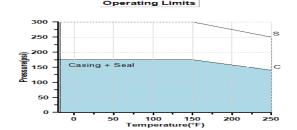
^{*}If minimum maintained system pressure is not known, default is 40% of design head.

^{**} The IVS 102 control is a low harmonic control with a built-in DC link reactor equivalent in performance to a 5% AC line reactor. This does not guarantee performance to any system wide harmonic specification or the costs to meet a system wide specification. If supplied with the system electrical details, Armstrong will run a computer simulation of the system wide harmonics. If system harmonic levels are exceeded, Armstrong can also recommend additional harmonic mitigation and the cost for such mitigation.





Operating limits (temperature - pressure)



Maximum pressure: 175 psi
Maximum temperature: 250 F

Pump casings are hydrostatically tested to 150% of maximum pump working pressure rating.

Design envelope pumping unit capability

Operating point	Flow	Head	Efficiency
Full capability at 100% design flow	167 USgpm	69.7 ft	63.27 %
Design point	167 USgpm	47 ft	62.79 %
50% average flow (with default load profile)	83.5 usapm	25 9 ft	59.27 %

REVIEWED

Dimensional data (not lo	TO STUBLED AND MODIFIED
Side view	REVISE AND RESUBMIT
R: 4.00 [102]	■ NOT REVIEWED

Engineering [is2] for the sole certaining conformance with concept. This review shall not mean design inherent in the shop drawings 20.01 responsibility 50f] which shall remain 508 ctor submitting same and review shall not Contractor of this responsibility for errors the shop drawings for meeting all requirements of the ct Documents. The Contractor is responsible for dimensions to be confirmed and correlated at the ⁹ for information pertains solely to construction and installation and for co-ordination of the work of all sub-trades.

Weight: 379 lb
• Not to scale

JRP Engineering

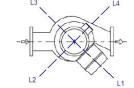
• R = minimum lifting clearance
• Units of measure: inches [mil M. Karakolis

Coupling guard and flush line (not shown) are supplied

• Tolerance of ± 0.125 inch (± 3 mm) should be used DATE: May 10th, 2017

· For certified dimensions, please contact your Armstrong representative

• Pump equipped with casing drain plug and ¼ inch NPT suction and discharge gauge ports



14.53 [369] 11.56

294

21.00

533

Connection details

Connection	Size	Rating	OD	Bolt quantity*	BCD	Bolt size
Inlet	3	ANSI-125	7.5	4	6	0.625
Outlet	3	ANSI-125	7.5	4	6	0.625

^{*}Equally spaced straddling centreline

Special instructions

The program has defaulted to a NEMA Premium Efficiency motor supplied with NEMA MG-1 Part 31.4.4.2 insulation standards for inverter-fed polyphase motors.

OSHPD Seismic Certification OSP-0422-10 UL STD 778 & CSA STD C22.2 no.108 certified

Selected options

Environmental Application: Indoors

Additional equipment

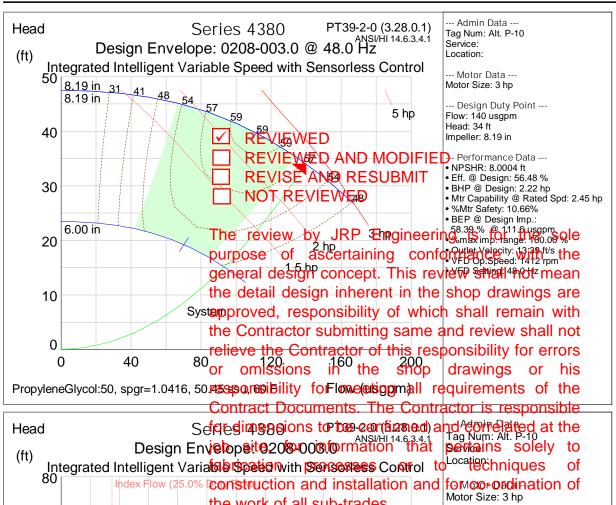
Flotrex: FTV-3FA (570200-477) Suction Guide: SG-33 (516860-019)

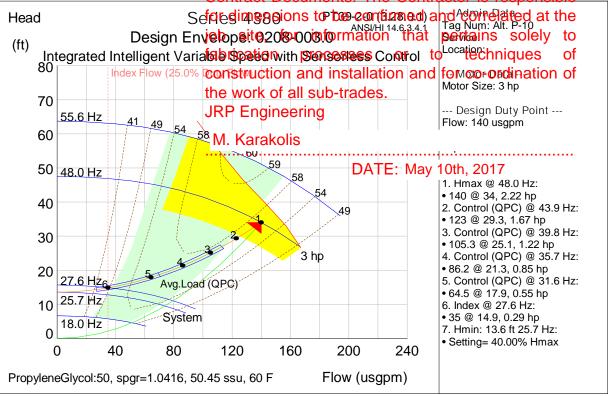


Design envelope close	coupled vertical in-line	pump	
Model: Series Design Env	elopesensoriess 4380 0208 REVIEWED AN	-003.0 D MODIFIED	
Project name: Tomlinson Pu	mps REVISE AND R	ESUBMIT	
Location:	☐ NOT REVIEWE	Representative: Walmar Limite	ed Nepean, Ontario
Date submitted: 3/31/2017	_	Phone number:	
Engineer:	The review by JRF	Pe-nangineeringreisebutonema	i h@ wa sod⊖ net
Contractor:	•	Bininged 60nforman 66 ene v	
Application design data		ept. This review shall n	
Tag number:		epentrientathoe: shop draw	
Service:		lityction prothich shall rem	
Location:		itting same and review	
Quantity:	ine Contractor Subm	Operating temperature:	or ^{60 F}
Duty flow per pump:	140 USgpm	r of this responsibility to Viscosity:	or errors 50.45 SSU
Duty head:	34 n omissions in	the shop drawings	or ₀₄₁ his
Environment:		eting _{fa} ell, «reguirements	
Total dissolved solids:	o Contract Documents		
Materials of construction	• • •	confirmed and correlate	•
Construction:		ation ler:that pertains s	
Rating:	ANSINIZE Process		ues of
Connections:	Inlet: 2 in Outlet: 2 in	Gasing gasket:	Confined Non-Asbestos Fiber
Casing (volute):	Construction and Inst Cast Iron (BS1452 GR220)	allation and for co-ofdir Flush line:	Pation of Braided Stainless Steel
Mechanical seal data	the work of all sub-tra	ades.	
Seal type:	JRP Engineering Inside Single Spring	Rotating face:	Sintered Silicon Carbide
Manufacturer code:	SS(M. Karakolis	<u> </u>	ilicon Carbide
Springs:	Stainless Steel	- Secondary seal:	EHDM
Rotating hardware:	Stainless Steel	DATE: May 10th, 2017	
Motor electrical data		•	
Supplier:	Factory Choice	Insulation class:	Class F Insulation
Size:	3 hp	Inverter motor type:	Inverter Duty
Frame number:	182JM	Efficiency:	NEMA Prem (12.12)
Enclosure:	TEFC	Operating speed @ 100% flow:	1412 rpm
Motor Electrics:	575/3/60	Operating speed @ 50% flow:	959 rpm
IVS102 controller data			
Sensorless control:	Yes-Quadratic press control	Communication port:	RS 485
	'	'	
BMS protocol:	BACnet Native	Analog inputs:	2 (current or voltage)
Enclosure:	UL Type 12	Analog outputs:	1 (current)
Fused disconnect switch:	No	Digital inputs:	4 (programmable)
Control orientation:	L1	Digital outputs:	2 (programmable)
Expansion card: BHP at 50% load/flow and	None	Cooling:	Fan cooled through back channel
55% of design head:	0.55 hp	Ambient temperature:	14F to 113F (up to 3280ft elevation)
Meets ASHRAE 90.1:	Yes	EMI/RFI control:	Integrated fliter to meet EN61800-3
Min. maintained sys. pressure:	13.6 ft	Harmonic suppression:	Integrated DC link reactor**

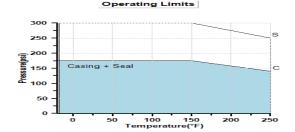
 $^{^{\}star}\text{If}$ minimum maintained system pressure is not known, default is 40% of design head.

^{**} The IVS 102 control is a low harmonic control with a built-in DC link reactor equivalent in performance to a 5% AC line reactor. This does not guarantee performance to any system wide harmonic specification or the costs to meet a system wide specification. If supplied with the system electrical details, Armstrong will run a computer simulation of the system wide harmonics. If system harmonic levels are exceeded, Armstrong can also recommend additional harmonic mitigation and the cost for such mitigation.





Operating limits (temperature - pressure)



Maximum pressure: 175 psi
Maximum temperature: 250 F

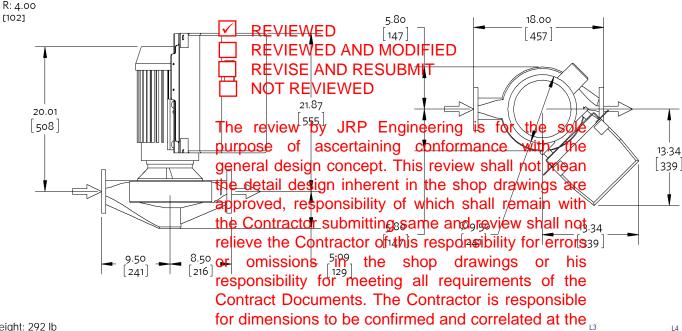
Pump casings are hydrostatically tested to 150% of maximum pump working pressure rating.

Design envelope pumping unit capability

Operating point	Flow	Head	Efficiency
Full capability at 100% design flow	140 USgpm	40.9 ft	57.94 %
Design point	140 USgpm	34 ft	56.48 %
50% average flow (with default load profile)	70 usqpm	18.7 ft	56.15 %

Dimensional data (not for construction)

Top view Side view



Weight: 292 lb · Not to scale

- Not to scale
 R = minimum lifting clearance required above motor rabrication
- Units of measure : inches [millimeters]
- Coupling guard and flush line (not shown) are repristruction and installation and for co-ordination of
- Tolerance of ± 0.125 inch (± 3 mm) should be used
- For certified dimensions, please contact your Atherwork refeath sub-trades.

• Pump equipped with casing drain plug and ¼ ing property and ¼ ing property and ¼ ing property and in the property and in

M. Karakolis Connection details

•	Connection	Size	Rating	Pating OD Patter May 10th 2017		, ,	
-	Inlet	2	ANSI-125	6 DAT	E. May Tuth, 20	J17	0.625
•	Outlet	2	ANSI-125	6	4	4.75	0.625

processes

job site, for information that pertains solely to

Special instructions

The program has defaulted to a NEMA Premium Efficiency motor supplied with NEMA MG-1 Part 31.4.4.2 insulation standards for inverter-fed polyphase motors.

OSHPD Seismic Certification OSP-0422-10 UL STD 778 & CSA STD C22.2 no.108 certified

Selected options

Environmental Application: Indoors

Additional equipment

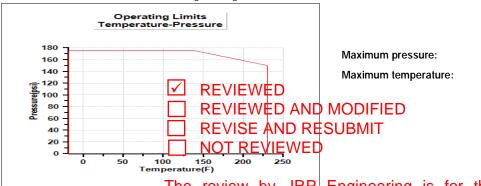
Flotrex: FTV-3FA (570200-477) Suction Guide: SG-32 (516860-016)

^{*}Equally spaced straddling centreline



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Model:		FTV-F	to No Ind	R EVIEWE	ED								
Project name	٠.	Tomlinson Du	mne .			_			_				
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Location:		pur	pose c	of ascert	aining 🔌	conforn	nance	With	the	реап, С	JIIIaiio		
Date submitte	e a :	3/3 1/20 1 gen	neral des	sian cond	ept. This	reviet	₩ ^r shal	ll not m	ean				
Engineer:		the	detail o	design inh	nerent in	^{mail:} e sh	nop dr	renebuene awings	man@w. are	almar.r	net		
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P2a/b	2	FTV-4 fa bi			se ^{sylSI-1} efr			iq û ê\$ ^{si}		2a/b [Design Env 4200H 25	elope Sens	orless
P3a/b	2	FTV-3FQN	structio	n avag _{le} ins	tallations		႞ၟၞၯၟႄႜၐၟၦ	rdinatio	n of P	3a/b [Design Env	elope Sens	orless
			work of						D.		4200H 15		1000
P-9	1	FTV-3FA	P Engin	Angle eering ed	ANSI-125		USgpm	1.9 psi			0308-0		
P-10	1	FTV-3F M.	Karako	Anala	ANOL 10F	1400	110	4	^{I D} -1	0 Des	sign Envelo 0308-0	pe Sensorle 003.0	ess 4380
P-11	1	FTV-2TS	2 in	Straight Threaded	None DATE: I				P-1	1 Des	sign Envelo 1508-0	pe Sensorle	ess 4380
P-12	1	FTV-3FA	3 in	Angle Flanged	ANSI-125	•	USgpm	2.5 psi	P-1	2 Des		pe Sensorle	ess 4380
*at design flow	I M/	l	I	Tangou	ļ	ı		ļ	l		00.00	70010	
at acsign not	vv												
Materials of													
	-Trex Va	alve-ANSI-125									TV-Flanged		
Body:		Cast Iron AST				Spring:						1 A313 Type	
Disc:		Bronze ASTM	B584-C84	400		Orings:				•	,	mers & EPI	
Seat:		EPDM			2	2 metering	ports:			sketed (M Check ar	10
Stem:		Stainless Stee	el ASTM A5	82 Type 416	2	2 drain tapp	oings:		1/4" [NPT wi	th Brass Pl	ug	
					1								
FTV-4FA-Flo-	-Trex Va	alve-ANSI-125	-Angle Flan	nged						F	TV-Flanged	1-2.5-12	
Body:		Cast Iron AST			9	Spring:						1 A313 Type	
Disc:		Bronze ASTM	B584-C84	400		Orings:						mers & EPI	
Seat:		EPDM				2 metering	ports:			ss Body keted (M Check ar	nd
Stem:		Stainless Stee	el ASTM A5	82 Type 416	2	2 drain tapp	oings:				th Brass Pl	ua	

Body:	Trex Valve-ANSI-125-Angle Flanged Cast Iron ASTM A48 Class 30	Spring:	FTV-Flanged-2.5-12 Stainless Steel ASTM A313 Type 302
Disc:	Bronze ASTM B584-C84400	<u> </u>	BUNA (STEM) Elastomers & EPDM
Seat:	EPDM	O rings: 2 metering ports:	Brass Body with EPDM Check and Gasketed Cap
Stem:	Stainless el A EN A E	2 drain tappings:	1/4" NPT with Brass Plug
	REVIEWED AND N	MODIFIED	
	REVISE AND RES		
ΓV-3FA-Flo-	Trex Valve-ANSI 125-Angle Flanged / IEWED	ODIVITI	FTV-Flanged-2.5-12
Body:	Cast Iron AS TM A48 Class 30	Spring:	Stainless Steel ASTM A313 Type 302
Disc:	Bronze ASTM B584-C84400	O rings:	BUNA (STEM) Elastomers & EPDM
Seat:	EPDM The review by JRP E		
Stem:	purpose of ascertaining Stainless Steel ASTM 4587 JAP CONCEPT.	ng conformance wi . This review shall no	ur ure
	the detail design inhere		
ΓV-3FA-Flo-	approved, responsibility Trex Valve-ANSI, 125-Angle Flanged The Contractor submitting	of which shall rema	in with FTV-Flanged-2.5-12
Body:	Cast Iron ASTM A48 Class 30	Spring:	Stainless Steel ASTM A313 Type 302
Disc:	Bronze ASHANG4HOONTRACTOR O	i triis responsibility for	EITOI BUNA (STEM) Elastomers & EPDM
Seat:	EPDM or omissions in the responsibility for meeti		or hisrass Body with EPDM Check and of the Gasketed Cap
Stem:	Stainless Steel ASTM 4582 Type 416 Contract Documents. TI	he Contractor is resp	
	for dimensions to be cor		
V-2TS-Flo-	Trex Valve-Straight Threaded for information	on that pertains so	lely to FTV1.25-2
Body:	SS 304 Amprication processes	og _{prin} to technique	
Disc:	Brass C4690 struction and installa	ation and for co-ordina	ation of PDM
J13C.			
	Brass C44560work of all sub-trade		Brass Body with EPDM Check and
	JRP Engineering		
Stem: TV-3FA-Flo-	JRP Engineering M. Karakolis Trex Valve-ANSI-125-Angle Flanged DA	2 metering ports: 2 drain tappings: TE: May 10th, 2017	Brass Body with EPDM Check and Gasketed Cap ¼" NPT with SS 304 Plug FTV-Flanged-2.5-12
Stem: TV-3FA-Flo- Body:	JRP Engineering M. Karakolis Trex Valve-ANSI-125-Angle Flanged Cast Iron ASTM A48 Class 30	2 metering ports: 2 drain tappings: TE: May 10th, 2017 Spring:	Brass Body with EPDM Check and Gasketed Cap ¼" NPT with SS 304 Plug FTV-Flanged-2.5-12 Stainless Steel ASTM A313 Type 302
Stem: TV-3FA-Flo- Body: Disc:	JRP Engineering M. Karakolis Trex Valve-ANSI-125-Angle Flanged Cast Iron ASTM A48 Class 30 Bronze ASTM B584-C84400	2 metering ports: 2 drain tappings: TE: May 10th, 2017 Spring: O rings:	Brass Body with EPDM Check and Gasketed Cap ¼" NPT with SS 304 Plug FTV-Flanged-2.5-12 Stainless Steel ASTM A313 Type 302 BUNA (STEM) Elastomers & EPDM
Stem: TV-3FA-Flo- Body: Disc:	JRP Engineering M. Karakolis Trex Valve-ANSI-125-Angle Flanged Cast Iron ASTM A48 Class 30	2 metering ports: 2 drain tappings: TE: May 10th, 2017 Spring:	Brass Body with EPDM Check and Gasketed Cap ¼" NPT with SS 304 Plug FTV-Flanged-2.5-12 Stainless Steel ASTM A313 Type 302
Stem:	JRP Engineering M. Karakolis Trex Valve-ANSI-125-Angle Flanged Cast Iron ASTM A48 Class 30 Bronze ASTM B584-C84400	2 metering ports: 2 drain tappings: TE: May 10th, 2017 Spring: O rings:	Brass Body with EPDM Check and Gasketed Cap ¼" NPT with SS 304 Plug FTV-Flanged-2.5-12 Stainless Steel ASTM A313 Type 302 BUNA (STEM) Elastomers & EPDM Brass Body with EPDM Check and
TV-3FA-Flo- Body: Disc: Seat: Stem:	JRP Engineering M. Karakolis Trex Valve-ANSI-125-Angle Flanged Cast Iron ASTM A48 Class 30 Bronze ASTM B584-C84400 EPDM Stainless Steel ASTM A582 Type 416	2 metering ports: 2 drain tappings: TE: May 10th, 2017 Spring: O rings: 2 metering ports:	Brass Body with EPDM Check and Gasketed Cap ¼" NPT with SS 304 Plug FTV-Flanged-2.5-12 Stainless Steel ASTM A313 Type 302 BUNA (STEM) Elastomers & EPDM Brass Body with EPDM Check and Gasketed Cap ¼" NPT with Brass Plug
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TV-3FA-Flo-Body: Seat: Stem: TV-3FA-Flo-Body:	JRP Engineering M. Karakolis Trex Valve-ANSI-125-Angle Flanged Cast Iron ASTM A48 Class 30 Bronze ASTM B584-C84400 EPDM Stainless Steel ASTM A582 Type 416 Trex Valve-ANSI-125-Angle Flanged Cast Iron ASTM A48 Class 30	2 metering ports: 2 drain tappings: 2 drain tappings: TE: May 10th, 2017 Spring: O rings: 2 metering ports: 2 drain tappings: Spring:	Brass Body with EPDM Check and Gasketed Cap ¼" NPT with SS 304 Plug FTV-Flanged-2.5-12 Stainless Steel ASTM A313 Type 302 BUNA (STEM) Elastomers & EPDM Brass Body with EPDM Check and Gasketed Cap ¼" NPT with Brass Plug FTV-Flanged-2.5-12 Stainless Steel ASTM A313 Type 302
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TV-3FA-Flo-Body: Stem: TV-3FA-Flo-Body: Disc:	JRP Engineering M. Karakolis Trex Valve-ANSI-125-Angle Flanged Cast Iron ASTM A48 Class 30 Bronze ASTM B584-C84400 EPDM Stainless Steel ASTM A582 Type 416 Trex Valve-ANSI-125-Angle Flanged Cast Iron ASTM A48 Class 30 Bronze ASTM B584-C84400 EPDM	2 metering ports: 2 drain tappings: 2 drain tappings: TE: May 10th, 2017 Spring: O rings: 2 metering ports: 2 drain tappings: Spring: O rings: 2 metering ports:	Brass Body with EPDM Check and Gasketed Cap ¼" NPT with SS 304 Plug FTV-Flanged-2.5-12 Stainless Steel ASTM A313 Type 302 BUNA (STEM) Elastomers & EPDM Brass Body with EPDM Check and Gasketed Cap ¼" NPT with Brass Plug FTV-Flanged-2.5-12 Stainless Steel ASTM A313 Type 302 BUNA (STEM) Elastomers & EPDM Brass Body with EPDM Check and Gasketed Cap
TV-3FA-Flo- Body: Disc: Seat: Stem:	JRP Engineering M. Karakolis Trex Valve-ANSI-125-Angle Flanged Cast Iron ASTM A48 Class 30 Bronze ASTM B584-C84400 EPDM Stainless Steel ASTM A582 Type 416 Trex Valve-ANSI-125-Angle Flanged Cast Iron ASTM A48 Class 30 Bronze ASTM B584-C84400	2 metering ports: 2 drain tappings: 2 drain tappings: TE: May 10th, 2017 Spring: O rings: 2 metering ports: 2 drain tappings: Spring: O rings: O rings:	Brass Body with EPDM Check and Gasketed Cap ¼" NPT with SS 304 Plug FTV-Flanged-2.5-12 Stainless Steel ASTM A313 Type 302 BUNA (STEM) Elastomers & EPDM Brass Body with EPDM Check and Gasketed Cap ¼" NPT with Brass Plug FTV-Flanged-2.5-12 Stainless Steel ASTM A313 Type 302 BUNA (STEM) Elastomers & EPDM Brass Body with EPDM Check and
TV-3FA-Flo-Body: Disc: Stem: TV-3FA-Flo-Body: Disc: Seat: Stem: Stem:	JRP Engineering M. Karakolis Trex Valve-ANSI-125-Angle Flanged Cast Iron ASTM A48 Class 30 Bronze ASTM B584-C84400 EPDM Stainless Steel ASTM A582 Type 416 Trex Valve-ANSI-125-Angle Flanged Cast Iron ASTM A48 Class 30 Bronze ASTM B584-C84400 EPDM Stainless Steel ASTM A582 Type 416	2 metering ports: 2 drain tappings: 2 drain tappings: TE: May 10th, 2017 Spring: O rings: 2 metering ports: 2 drain tappings: Spring: O rings: 2 metering ports:	Brass Body with EPDM Check and Gasketed Cap ¼" NPT with SS 304 Plug FTV-Flanged-2.5-12 Stainless Steel ASTM A313 Type 302 BUNA (STEM) Elastomers & EPDM Brass Body with EPDM Check and Gasketed Cap ¼" NPT with Brass Plug FTV-Flanged-2.5-12 Stainless Steel ASTM A313 Type 302 BUNA (STEM) Elastomers & EPDM Brass Body with EPDM Check and Gasketed Cap ¼" NPT with Brass Plug
TV-3FA-Flo-Body: Disc: Seat: Stem: TV-3FA-Flo-Body: Disc: Seat: Stem:	M. Karakolis M. Karakolis M. Karakolis Trex Valve-ANSI-125-Angle Flanged Cast Iron ASTM A48 Class 30 Bronze ASTM B584-C84400 EPDM Stainless Steel ASTM A582 Type 416 Trex Valve-ANSI-125-Angle Flanged Cast Iron ASTM A48 Class 30 Bronze ASTM B584-C84400 EPDM Stainless Steel ASTM A582 Type 416 Trex Valve-ANSI-125-Angle Flanged	2 metering ports: 2 drain tappings: 2 drain tappings: TE: May 10th, 2017 Spring: O rings: 2 metering ports: 2 drain tappings: Spring: O rings: 2 metering ports: 2 drain tappings:	Brass Body with EPDM Check and Gasketed Cap ¼" NPT with SS 304 Plug FTV-Flanged-2.5-12 Stainless Steel ASTM A313 Type 302 BUNA (STEM) Elastomers & EPDM Brass Body with EPDM Check and Gasketed Cap ¼" NPT with Brass Plug FTV-Flanged-2.5-12 Stainless Steel ASTM A313 Type 302 BUNA (STEM) Elastomers & EPDM Brass Body with EPDM Check and Gasketed Cap ¼" NPT with Brass Plug FTV-Flanged-2.5-12
TV-3FA-Flo-Body: Disc: Seat: Stem: TV-3FA-Flo-Body: Disc: Seat: Stem:	M. Karakolis M. Karakolis M. Karakolis M. Karakolis Trex Valve-ANSI-125-Angle Flanged Cast Iron ASTM A48 Class 30 Bronze ASTM B584-C84400 EPDM Stainless Steel ASTM A582 Type 416 Trex Valve-ANSI-125-Angle Flanged Cast Iron ASTM A48 Class 30 Bronze ASTM B584-C84400 EPDM Stainless Steel ASTM A582 Type 416 Trex Valve-ANSI-125-Angle Flanged Cast Iron ASTM A48 Class 30	2 metering ports: 2 drain tappings: 2 drain tappings: TE: May 10th, 2017 Spring: O rings: 2 metering ports: 2 drain tappings: Spring: O rings: 2 metering ports:	Brass Body with EPDM Check and Gasketed Cap ¼" NPT with SS 304 Plug FTV-Flanged-2.5-12 Stainless Steel ASTM A313 Type 302 BUNA (STEM) Elastomers & EPDM Brass Body with EPDM Check and Gasketed Cap ¼" NPT with Brass Plug FTV-Flanged-2.5-12 Stainless Steel ASTM A313 Type 302 BUNA (STEM) Elastomers & EPDM Brass Body with EPDM Check and Gasketed Cap ¼" NPT with Brass Plug FTV-Flanged-2.5-12 Stainless Steel ASTM A313 Type 302
TV-3FA-Flo-Body: Disc: Stem: TV-3FA-Flo-Body: Disc: Stem: TV-3FA-Flo-Body: Disc: Stem:	JRP Engineering M. Karakolis Trex Valve-ANSI-125-Angle Flanged Cast Iron ASTM A48 Class 30 Bronze ASTM B584-C84400 EPDM Stainless Steel ASTM A582 Type 416 Trex Valve-ANSI-125-Angle Flanged Cast Iron ASTM A48 Class 30 Bronze ASTM B584-C84400 EPDM Stainless Steel ASTM A582 Type 416 Trex Valve-ANSI-125-Angle Flanged Cast Iron ASTM A48 Class 30 Bronze ASTM B584-C84400	2 metering ports: 2 drain tappings: 2 drain tappings: TE: May 10th, 2017 Spring: O rings: 2 metering ports: 2 drain tappings: Spring: O rings: 2 metering ports: 2 drain tappings: Spring: O rings: 2 metering ports: O rings: O rings: O rings: O rings: O rings:	Brass Body with EPDM Check and Gasketed Cap ¼" NPT with SS 304 Plug FTV-Flanged-2.5-12 Stainless Steel ASTM A313 Type 302 BUNA (STEM) Elastomers & EPDM Brass Body with EPDM Check and Gasketed Cap ¼" NPT with Brass Plug FTV-Flanged-2.5-12 Stainless Steel ASTM A313 Type 302 BUNA (STEM) Elastomers & EPDM Brass Body with EPDM Check and Gasketed Cap ¼" NPT with Brass Plug FTV-Flanged-2.5-12 Stainless Steel ASTM A313 Type 302 BUNA (STEM) Elastomers & EPDM
TV-3FA-Flo-Body: Stem: TV-3FA-Flo-Body: Disc: Seat: Stem: Stem: Stem:	M. Karakolis M. Karakolis M. Karakolis M. Karakolis Trex Valve-ANSI-125-Angle Flanged Cast Iron ASTM A48 Class 30 Bronze ASTM B584-C84400 EPDM Stainless Steel ASTM A582 Type 416 Trex Valve-ANSI-125-Angle Flanged Cast Iron ASTM A48 Class 30 Bronze ASTM B584-C84400 EPDM Stainless Steel ASTM A582 Type 416 Trex Valve-ANSI-125-Angle Flanged Cast Iron ASTM A48 Class 30	2 metering ports: 2 drain tappings: TE: May 10th, 2017 Spring: O rings: 2 metering ports: 2 drain tappings: Spring: O rings: 2 metering ports: 2 drain tappings: Spring: 2 metering ports: 2 drain tappings:	Brass Body with EPDM Check and Gasketed Cap ¼" NPT with SS 304 Plug FTV-Flanged-2.5-12 Stainless Steel ASTM A313 Type 302 BUNA (STEM) Elastomers & EPDM Brass Body with EPDM Check and Gasketed Cap ¼" NPT with Brass Plug FTV-Flanged-2.5-12 Stainless Steel ASTM A313 Type 302 BUNA (STEM) Elastomers & EPDM Brass Body with EPDM Check and Gasketed Cap ¼" NPT with Brass Plug FTV-Flanged-2.5-12 Stainless Steel ASTM A313 Type 302



The review by JRP Engineering is for the sole FTV-2TS-Flo-Trex Valve-Straight Torres of ascertaining conformance with the operating the state of the stat the detail design inherent in the shop drawings are 180 approved, responsibility waxindrightesing il remain withsi 160 140 the Contractor submitting was more tamper new ew shall 2000 t 120 relieve the Contractor of this responsibility for errors 100 80 or omissions in the shop drawings or his 60 40 responsibility for meeting all requirements of the 20 ontract Documents. The Contractor is responsible 0 Tempor dimensions to be confirmed and correlated at the job site, for information that pertains solely to

Dimensional data (not for construction) processes or to techniques of

Model: FTV-4FS-Flo-Trex Valve-ANShistrigitation Famedinstallation and for co-ordination of

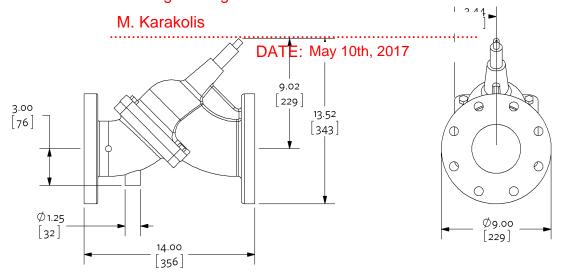
Weight: 26.8 kg

175 psi

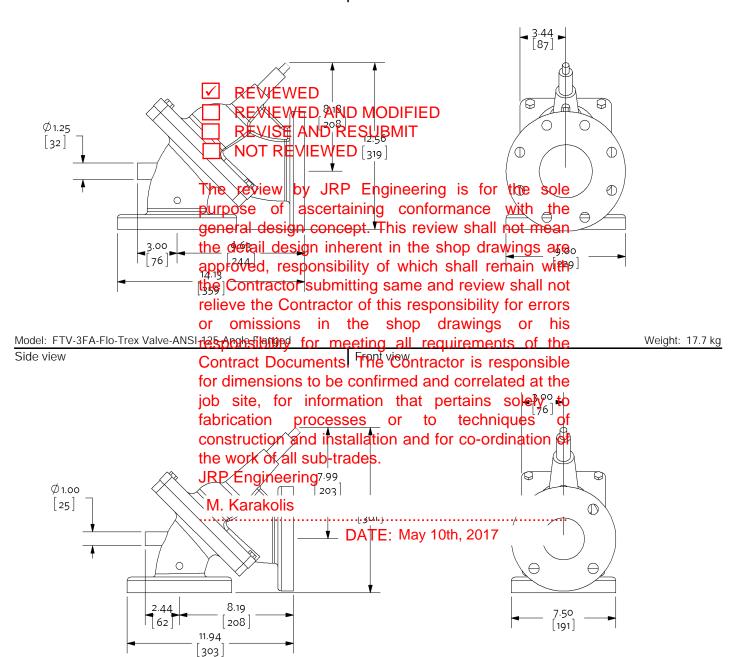
230 F

Side view

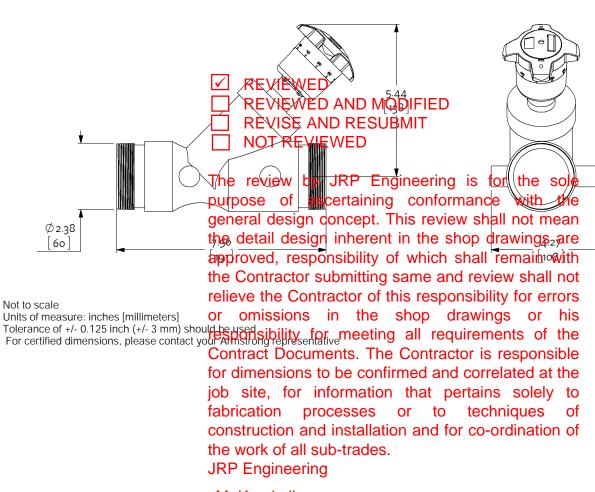
the work of all sub-trades. Front view JRP Engineering



Side view Front view



Side view Front view

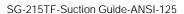


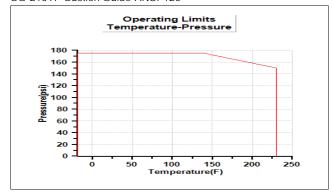
M. Karakolis

DATE: May 10th, 2017



Suction gui	ide					
Model:		SG (2 to 12	inches),	SG-TF		
Project name: Location:		Tomlinson Pui	mps	REVIEWE REVIEWE		Winner Limited Nepean, Ontario
Date submitted: Engineer:		3/31/2017		REVISE A	⋪ <mark>╢</mark> Ѿҽ <mark>Ҝ</mark> ҈Ѥ҈Ҏӷ҅ѲѴ	/IT renebueneman@walmar.net
Contractor:					Submitted by:	Rene Bueneman
Application de	sign	data		The review by		neering is for the sole
Tag	Qty	Model	System	general design		conformance with the special s
P2a/b	2	SG-33	3 in	the detail design	ga gj in <mark>ne sesn</mark>otsi ir	thræ/ts/pepgretrævvkingsenavæss 4200H 2506-015.0
P3a/b	2	SG-33	3 in			William Street Trentagin French Property Consideration 1506-007.5
P-9	1	SG-33	3 in		usupmitthogsis	
P-10	1	SG-33	3 in	<u> </u>	USapm 0.4 psi	
P-11	1	SG-215TF	2 in		JSgpm 0.0 psi	P-11 Design Envelope Sensorless 4380 1508-001.0
P-12	1	SG-33	3 in	responsibility		P-12 Design Envelope Sensoriess 4380 0310-005.0
Alt. P-9	1	SG-33	3 in			Alt GUULE GIALINE IODE SCHIST IESS 4380 0310-005.0
Alt. P-10	1	SG-32	3 in	1	01	Contractore is no expones in the ress 4380 0208-003.0
P-1a/b *at design flow	2	SG-44	4 in			ned BindbothAetAide Tathernemp (Factory Choice Motor) that pertains solely to
_				*	rocesses o	
Materials of co	onstr	uction		•		and for co-ordination of
SG-33				the work of all	sub-trades.	
Body:			Cast Iron	JRP Engineerii	Cover gasket:	Synthetic fiber
Guide vanes:			Cast Iron	<u></u>	Strainer:	Stainless Steel, 0.125" (3mm) Perf.
Cover plate:			Cast Iron	M. Karakolis		ed Steel
SG-215TF					DATE:	May 10th, 2017
Body:			Ductile Iro	n	Cover gasket:	Synthetic fiber
Guide vanes:			Ductile Iro	n	Strainer:	Stainless Steel, 0.125" (3mm) Perf.
Cover plate:			Ductile Iron	n	Start-up strainer*:	Fine Mesh Galvanized Steel
SG-33					' 	
Body:			Cast Iron		Cover gasket:	Synthetic fiber
Guide vanes:			Cast Iron		Strainer:	Stainless Steel, 0.125" (3mm) Perf.
Cover plate:			Cast Iron		Start-up strainer*:	Fine Mesh Galvanized Steel
SG-33			Coot Iran		· 	
Body:			Cast Iron		Cover gasket:	Synthetic fiber
Guide vanes:			Cast Iron		Strainer:	Stainless Steel, 0.125" (3mm) Perf.
Cover plate:			Cast Iron		Start-up strainer*:	Fine Mesh Galvanized Steel
SG-32						
Body:			Cast Iron		Cover gasket:	Synthetic fiber
Guide vanes:			Cast Iron		Strainer:	Stainless Steel, 0.125" (3mm) Perf.
Cover plate:			Cast Iron		Start-up strainer*:	Fine Mesh Galvanized Steel





Maximum pressure:175 psiMaximum temperature:230 F

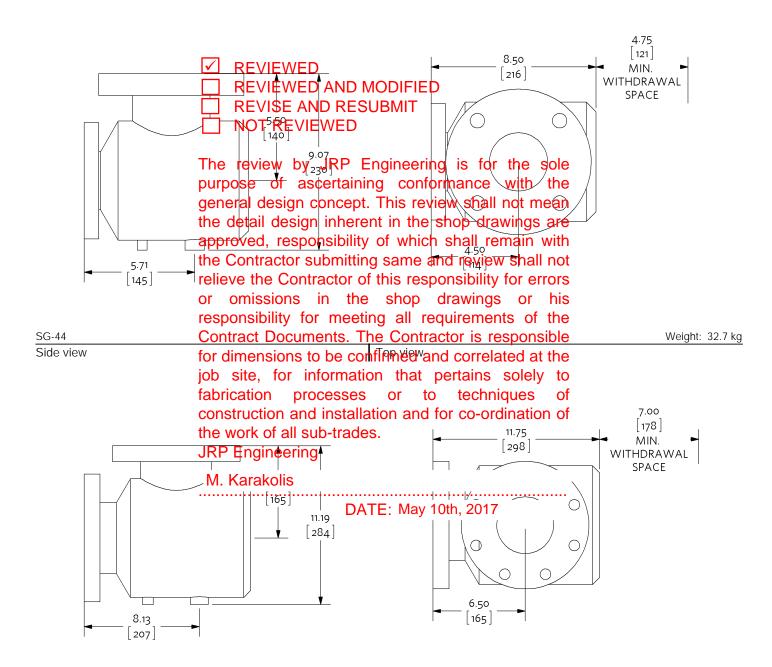
Units are hydrostatically tested to 150% of maximum working pressure

SG-33 Weight: 20.4 kg Side view Top view **REVIEWED REVIEWED AND MODIFIED** 5.50 140 **REVISE AND RESUBMIT** 9.88 MIN. 251 NOT REVIEWED WITHDRAWAL **SPACE** The review by JRP Engineering is for the sole of ascertaining conformance general design concept. This review shall not mean the detail design inherent in the shop drawings are approved, responsibility of which shall remain with the Contractor submitting same and review shall not relieve the Contractor of this responsibility for errors 7.00 or omissions in the shop drawing or [178] responsibility for meeting all requirements of the Contract Documents. The Contractor is responsible for dimensions to be confirmed and correlated at the SG-215TF job site, for information that pertains solely to Weight: 10.9 kg Side view brop tiow techniques processes fabrication construction and installation and for co-ordination of the work of all sub-trades. JRP Engineering 4.75 121 M. Karakolis MIN. WITHDRAWAL DATE: May 10th, 2017 **SPACE** 4.50 114 7.95 [202]

147

124

Side view Top view



Not to scale

Units of measure: inches [millimeters]

Tolerance of \pm 0.125 inch (\pm 3 mm) should be used

For certified dimensions, please contact your Armstrong representative