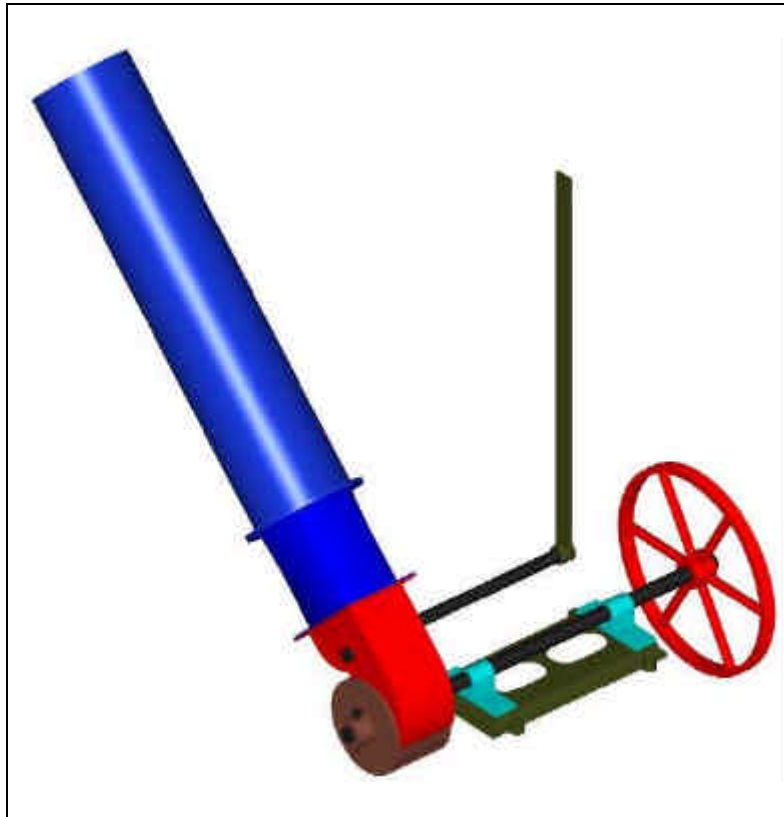


OPEN-CROSSFLOW

DESIGN PACK



This pack contains a complete set of engineering drawings for the manufacture of an *Open-Crossflow* micro-hydro turbine for use at sites with at least 5m head and at least 100 litres/sec flow

OPEN CROSSFLOW

List of parts

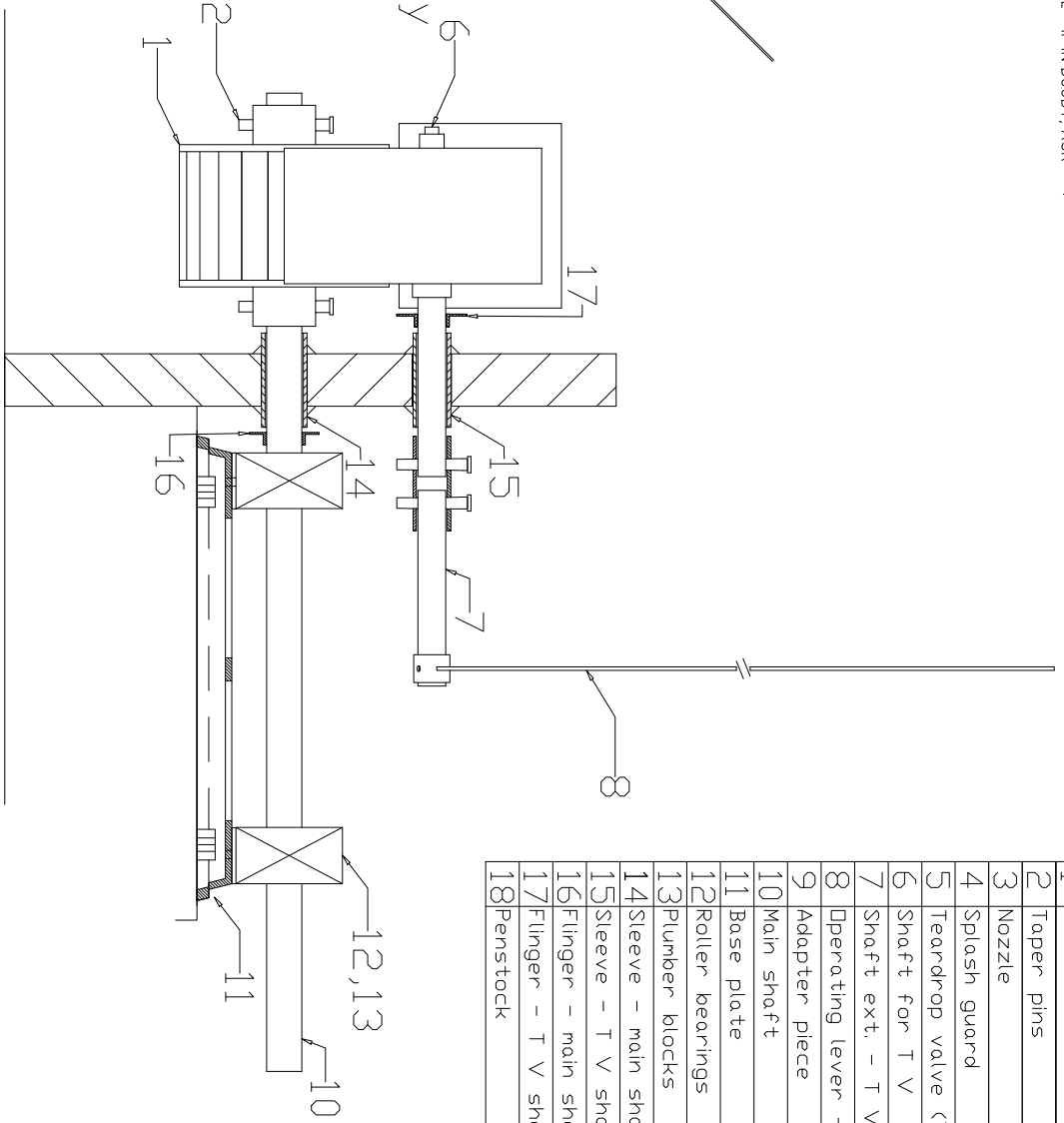
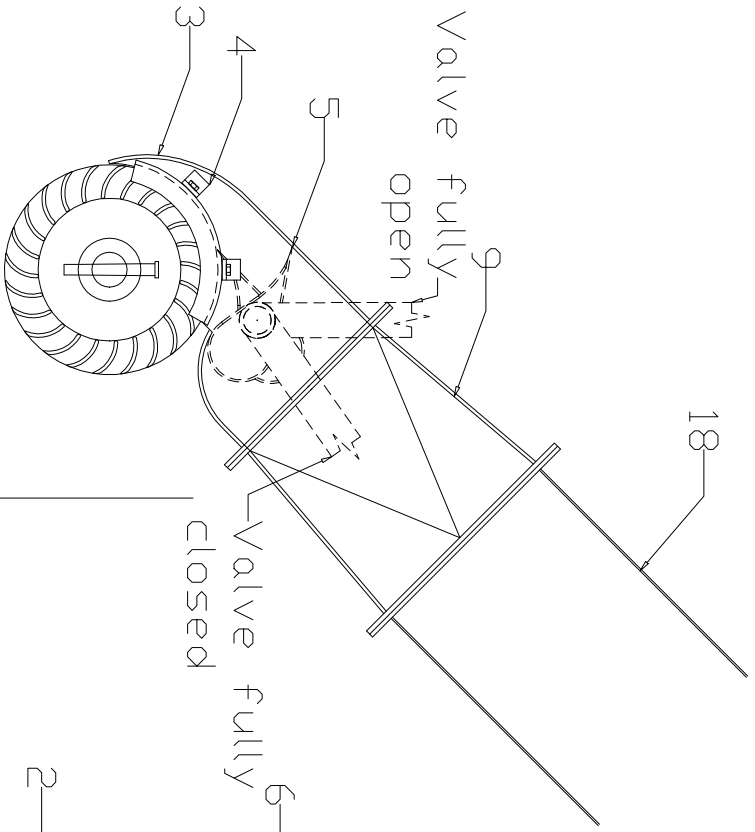
Principal parts are numbered below and labelled on assembly drawing **ITP-01-732-X00**.

No.	Item	Qty	Drawing No.	Comment
1	Crossflow runner	1	ITP-01-732-X01	Preferably made in cast iron or cast steel. Diameter 300mm, Width 184mm, Blades = 24
2	Taper pins	4	ITP-01-732-X01	Approx 15mm diameter
3	Crossflow nozzle	1	ITP-01-732-X02	Fabricated in steel
4	Splash guard	2	ITP-01-732-X03	Fabricated in steel
5	Teardrop valve	1	ITP-01-732-X04	Fabricated in steel
6	Shaft for tear drop valve	1	ITP-01-732-X04	50mm diameter shaft
7	Shaft extension for tear drop valve	1	ITP-01-732-X08	50mm diameter shaft
8	Teardrop valve adjusting handle	1	ITP-01-732-X11	Approx 1300mm long, with boss attachment to fit onto tear-dop valve shaft.
9	Transition piece	1	ITP-01-732-X05	Drawn to suit 300mm OD flanged penstock pipe
10	Crossflow runner shaft	1	ITP-01-732-X07	Mild steel, with holes for taper pin runner attachment. Diameter: 50mm, Length: 1400mm
11	Base-plate	1	ITP-01-732-X12	Cast iron or cast steel; can also be fabricated.
12	Spherical roller bearings with adapter sleeve, type 22 211	2	No drawing supplied	It is recommended that a reputable imported make of bearing is used eg. SKF, ZKL. Bearings must be dismantled, checked and greased prior to shipment.
13	Plumber blocks, type SNH 512 TC	2	No drawing supplied	To suit bearing type 22 211, plumber blocks to be supplied with felt seals (2 per bearing) and bolts & washers
14	Shaft support sleeve for runner shaft	1	ITP-01-732-X09	ID 55mm approx, Length 135mm
15	Shaft support sleeve for runner shaft	1	ITP-01-732-X09	ID 55mm approx, Length 135mm
16	Flinger	2	ITP-01-732-X10	To fit main shaft (diameter 50mm)
17	Flinger	1	ITP-01-732-X10	To fit operating shaft of tear drop valve (diameter 50mm)

Other recommended components

18	Penstock pipe joints		ITP-01-732-X06	Pipes can be supplied complete, or rolled and welded from 2.5mm steel plate. Joints can be either flange or socket type
19	Sheet rubber gaskets to suit flanges of penstock and adapter piece		No drawing supplied	
20	Main Drive Pulley	1	No drawing supplied	With shaft attachment to suit 50mm shaft, recommended OD 600mm, 3-groove, C-section
21	Pulley for rice-huller	1	No drawing supplied	OD 225mm, 1-groove, C-section
22	V-belt	1	No drawing supplied	C-section, recommended length 144 inches

DO NOT SCALE - IF IN DOUBT, ASK



1	Crossflow runner
2	Taper pins
3	Nozzle
4	Splash guard
5	Teardrop valve (T V)
6	Shaft for T V
7	Shaft ext. - T V
8	Operating lever - T V
9	Adapter piece
10	Main shaft
11	Base plate
12	Roller bearings
13	Plumber blocks
14	Sleeve - main shaft
15	Sleeve - T V shaft
16	Flinger - main shaft
17	Flinger - T V shaft
18	Penstock

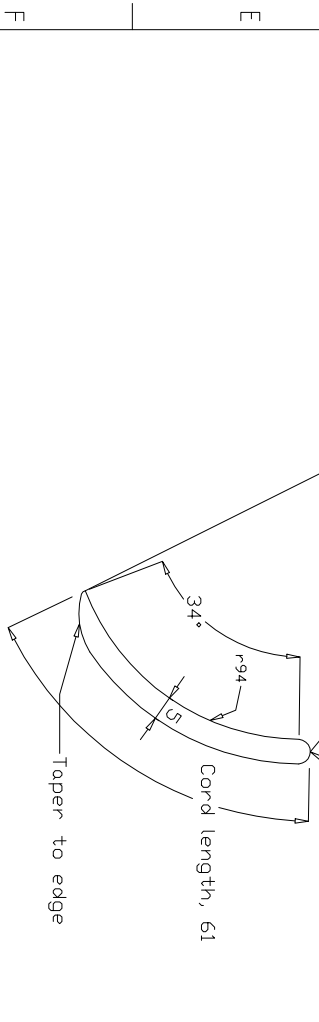
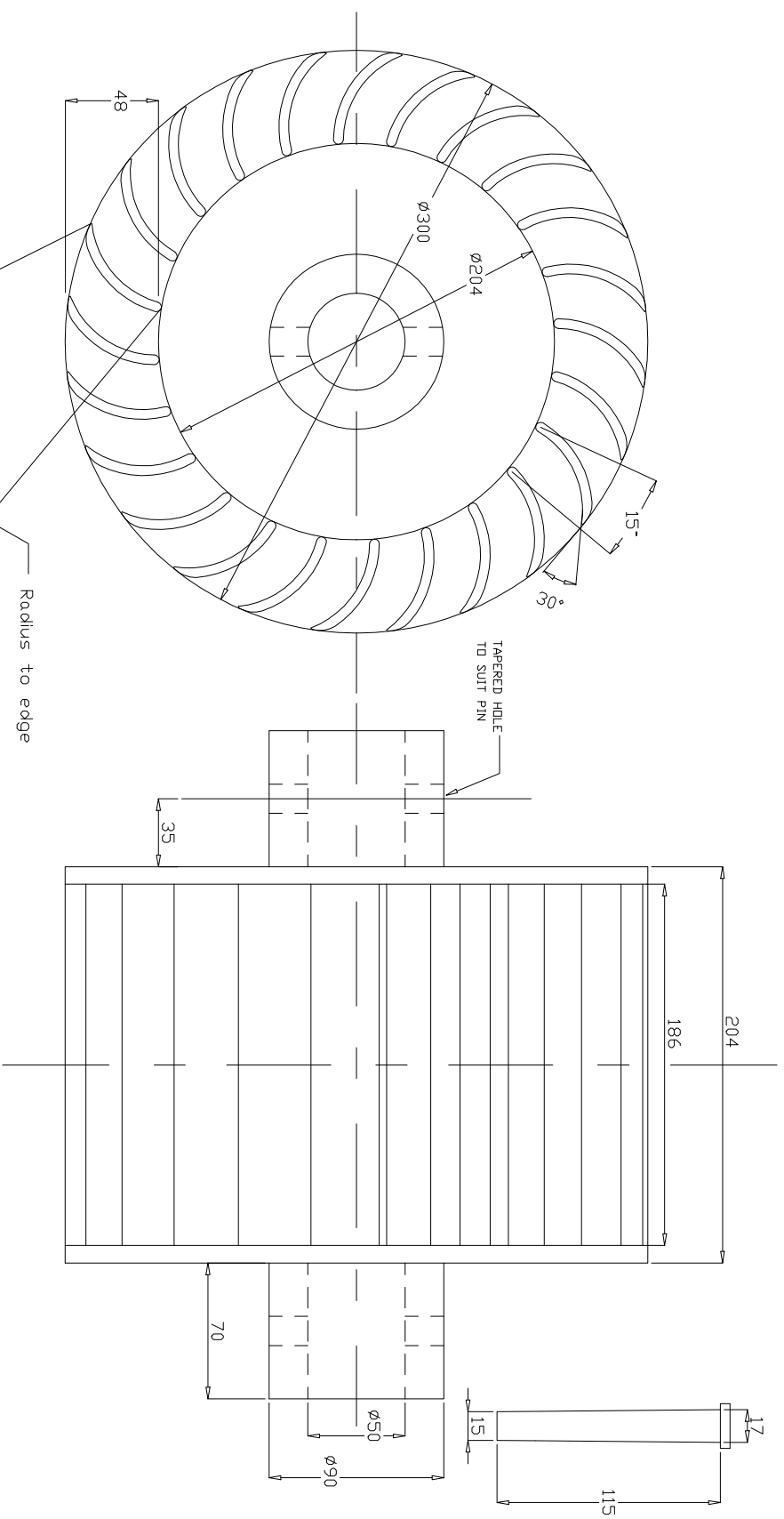
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<p>Power Ltd The Manor, Holes, Lylens Close Oxshott, Hampshire RG24 5AG, UK Telephone: +44 1256 392700 Fax: +44 1256 392700 E-Mail: itpower@power.co.uk</p>		<p>THIS DRAWING IS THE PROPERTY OF IT POWER LTD. IT MAY NOT BE USED, REPRODUCED OR ADAPTED WITHOUT PERMISSION IN WRITING FROM IT POWER LTD.</p>	
<p>Crossflow assembly</p>		DRG. NO.	ITP-01-0732-X00
Issue:	1	Sheet:	1/1

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No.	Revision note	Date	Signature	Checked
5				



Item	Quantity	Description	Part No.
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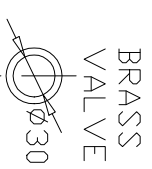
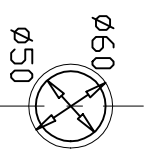
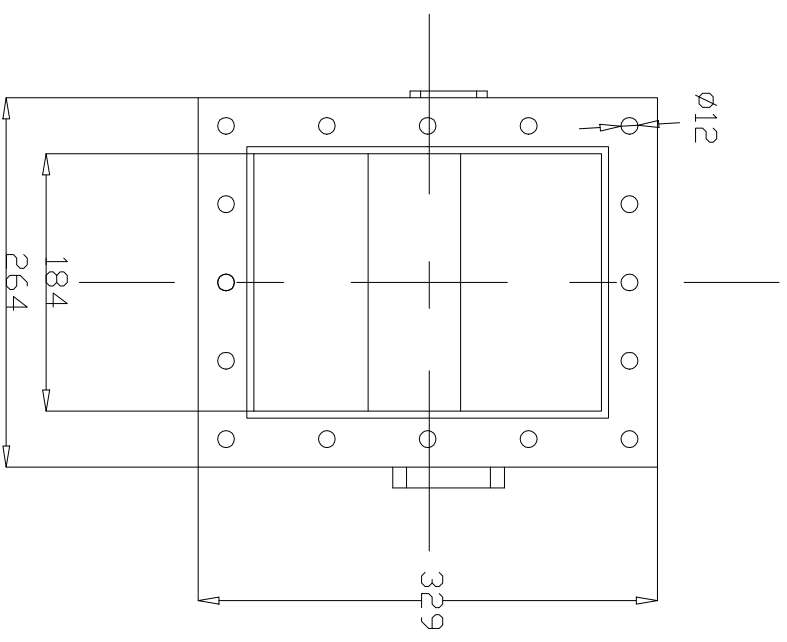
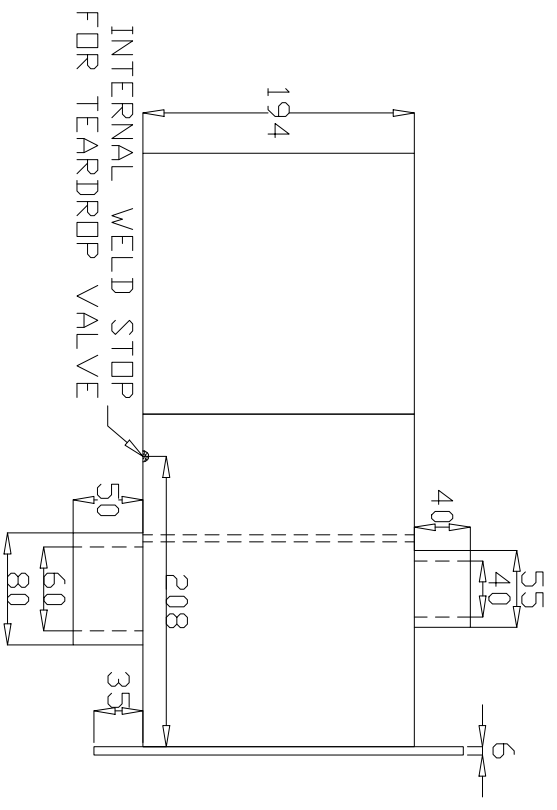
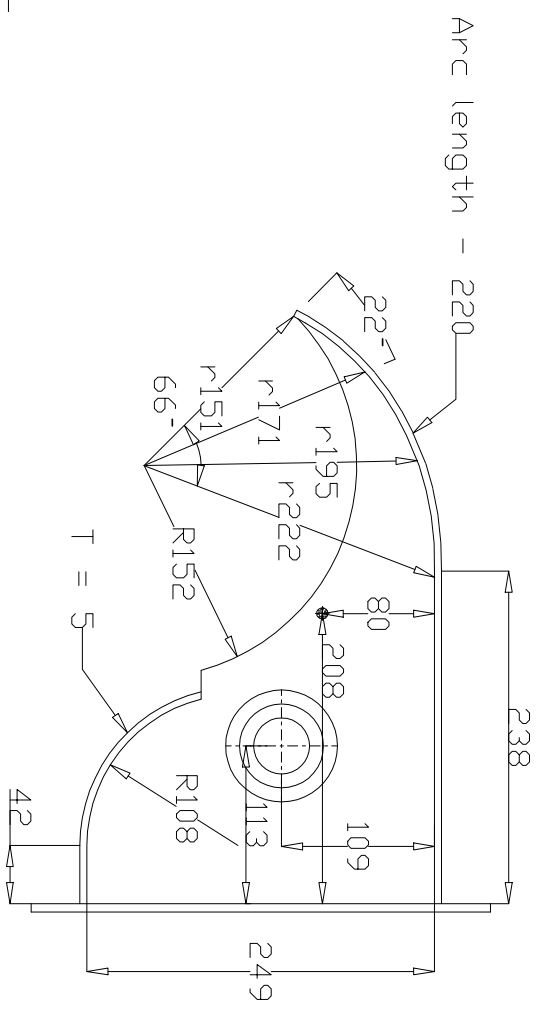
CROSSFLOW runner

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DRG NO. ITP-01-0732-X01	Issue: 1	Sheet: 1/1
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BRASS BUSHES FOR TEARDROP VALVE SHAFT

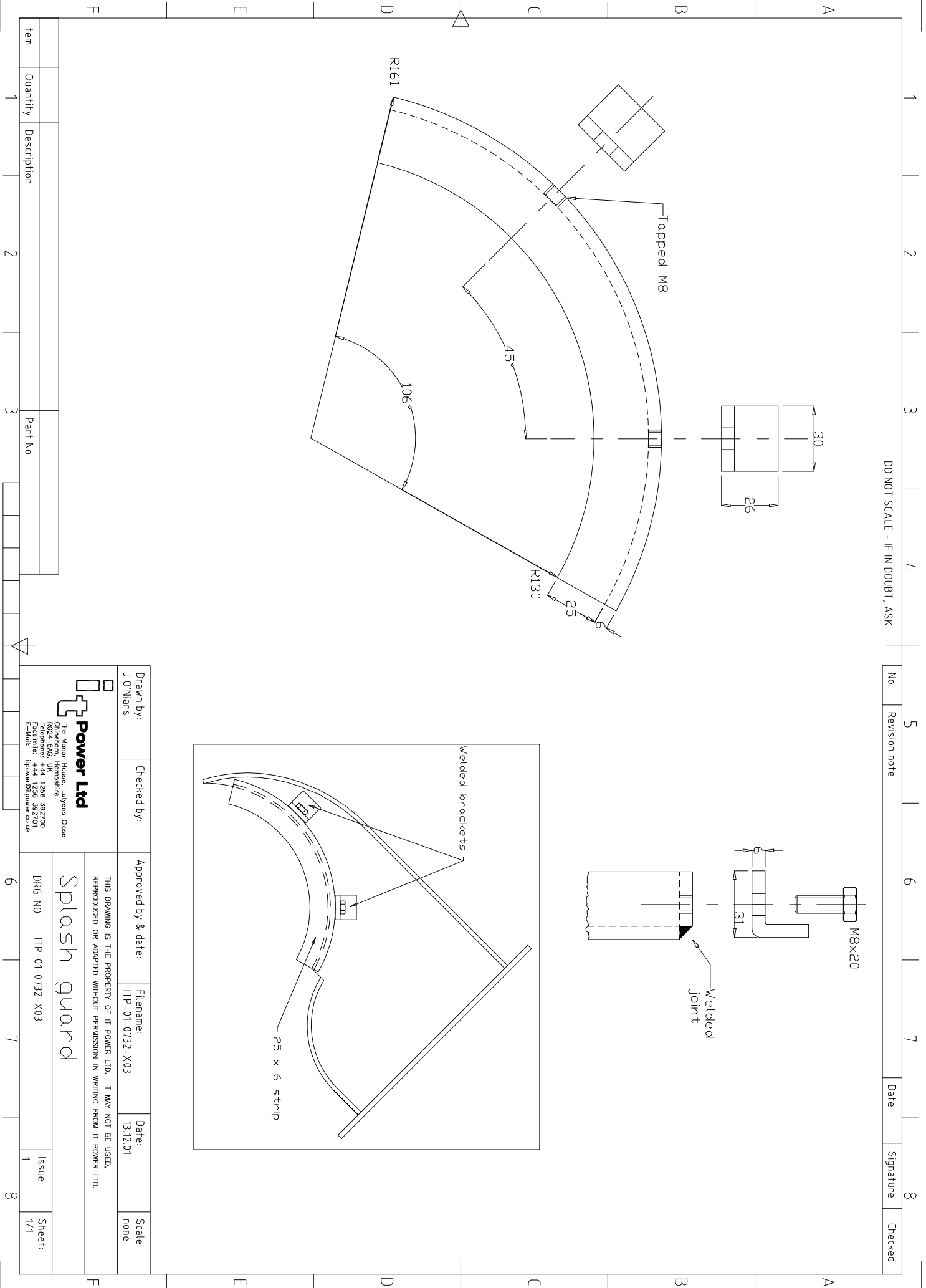
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<p>Crossflow nozzle</p>		<p>DRG. NO. ITP-01-0732-X02</p>	
Issue:	1	Sheet:	1/1

Item	Quantity	Description	Part No.
	1	INTERNAL WELD STOP FOR TEARDROP VALVE	

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No.	Revision note	Date	Signature	Checked
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8				



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Splash guard

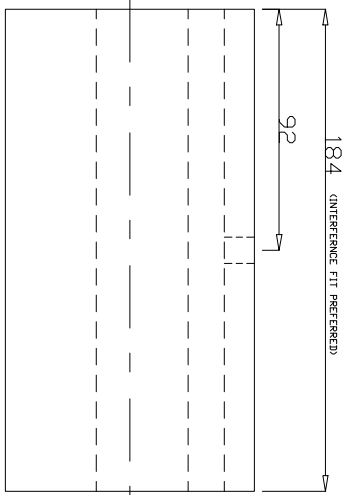
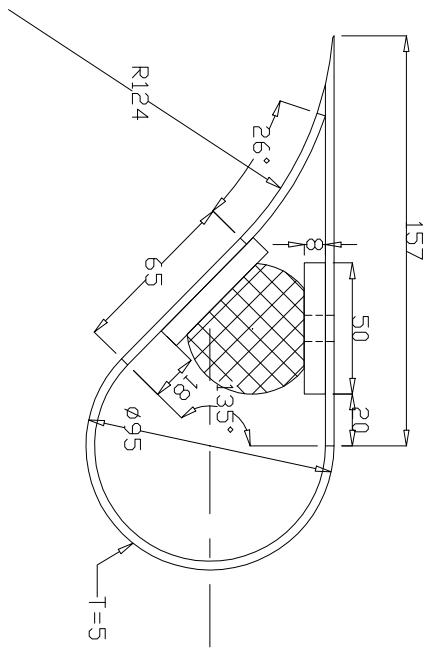
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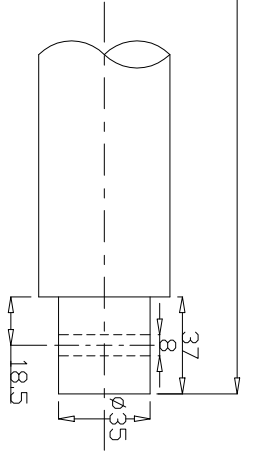
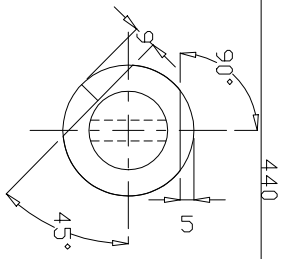
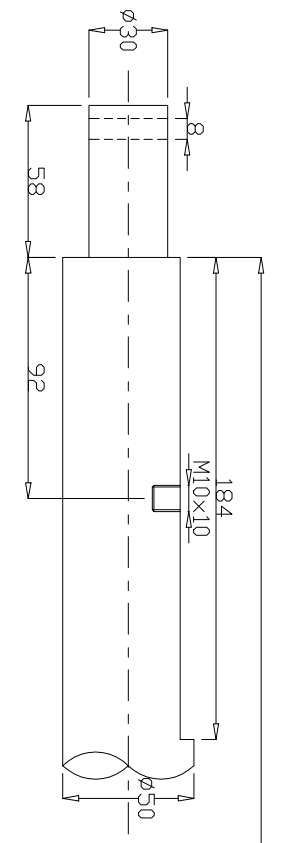
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TEARDROP VALVE SHAFT



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J.O'Nians			ITP-01-0732-X04	13.12.01	none

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Teardrop valve and shaft

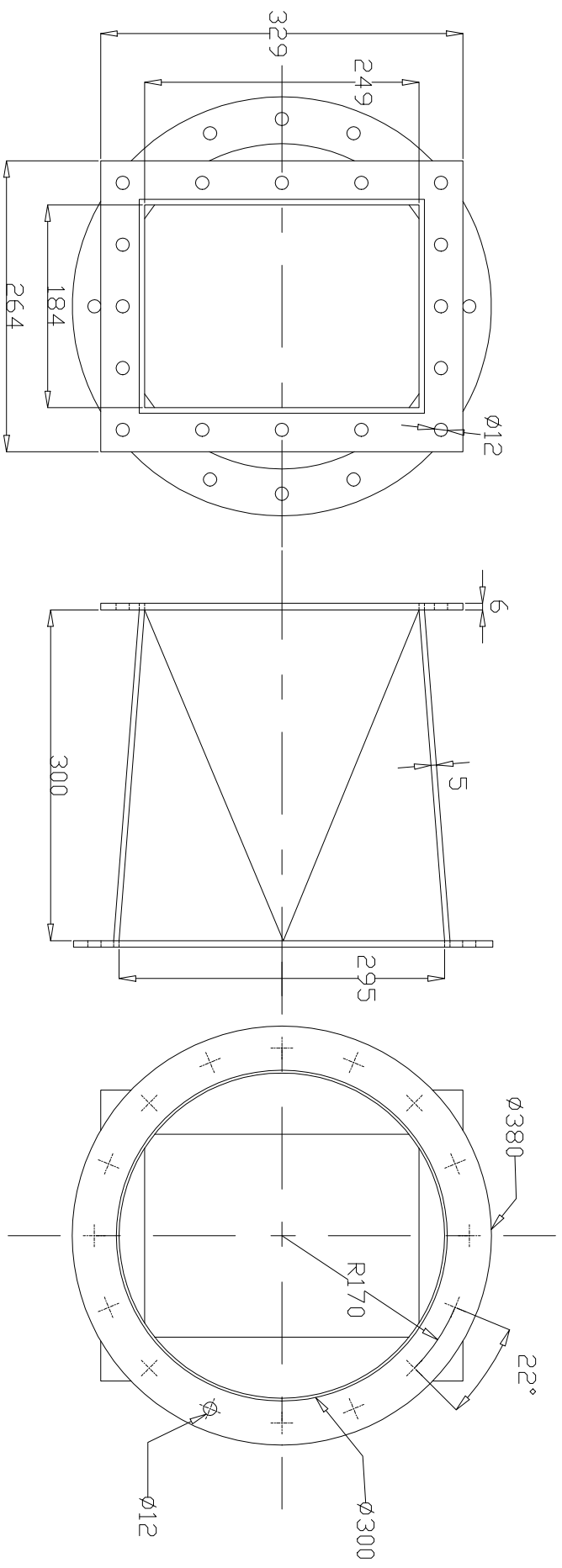
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Transition piece

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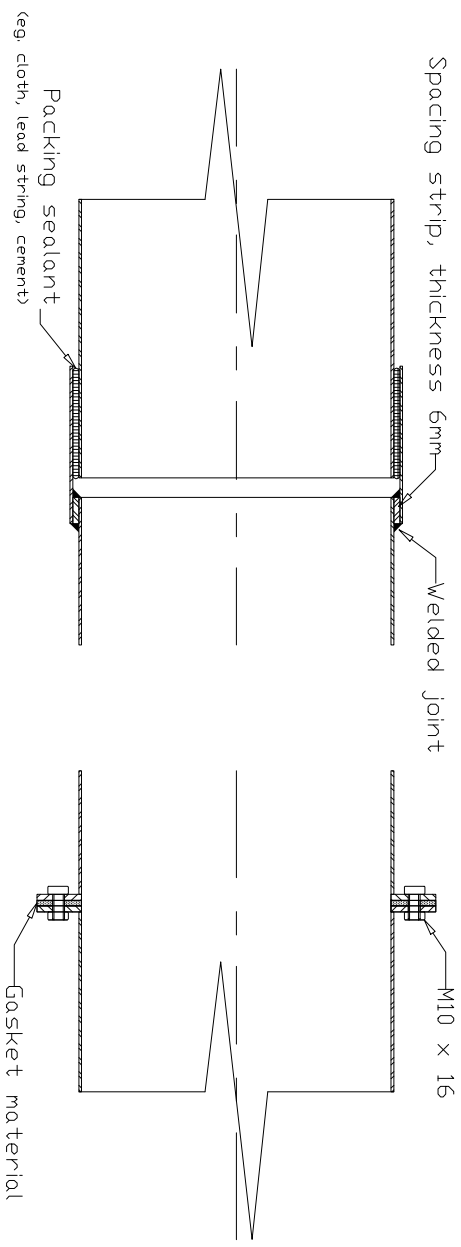
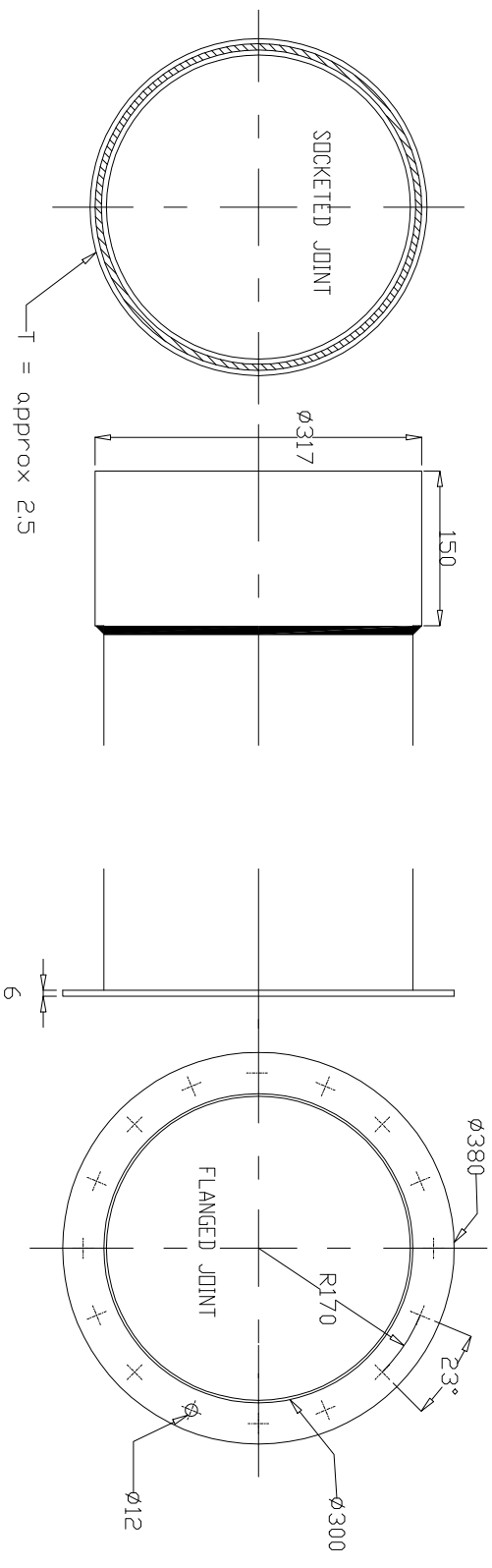
Power Ltd
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 Oldham, Greater Manchester
 M24 5AG, UK
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	3		

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Pipe joints

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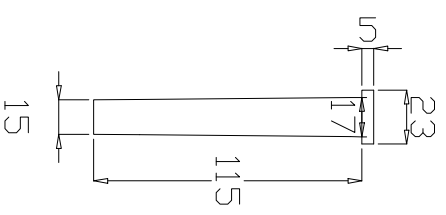
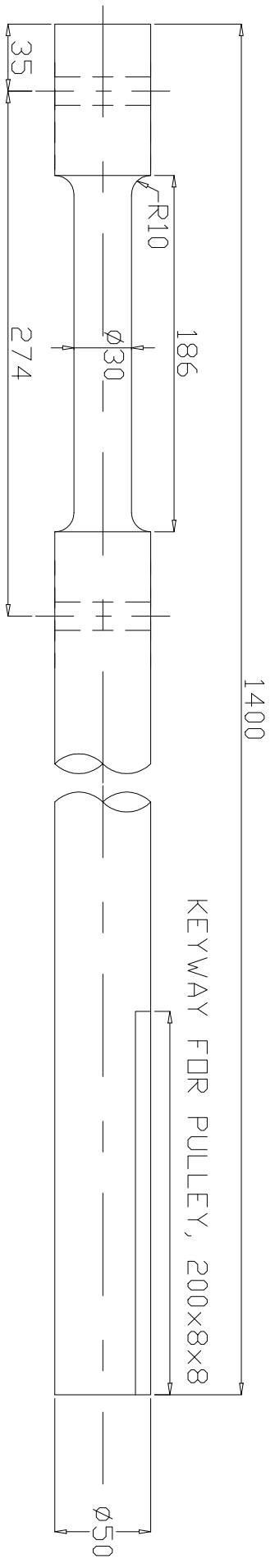
Power Ltd
 The Manor House, Ludlans Close
 Chesham, Bucks, UK
 RG24 5AG, UK
 Telephone: +44 1295 392700
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 E-Mail: itpower@power.co.uk

Item	Quantity	Description	Part No.
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Issue:	1
Sheet:	1/1

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No.	5	Revision note							
Date		Signature							
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Note: Use taper pin of approx $\varnothing 15$
Taper angle of less than 1°

Item	Quantity	Description	Part No.
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	3		

Drawn by:	J O Nians	Checked by:		Approved by & date:		Filename:	ITP-01-0732-X07	Date:	13.12.01	Scale:	none
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<p>Crossflow runner shaft</p>											
DRG NO.	ITP-01-0732-X07		Issue:	1	Sheet:	1/1					

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RG24 8AG, UK - 156 392700
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No. Revision note

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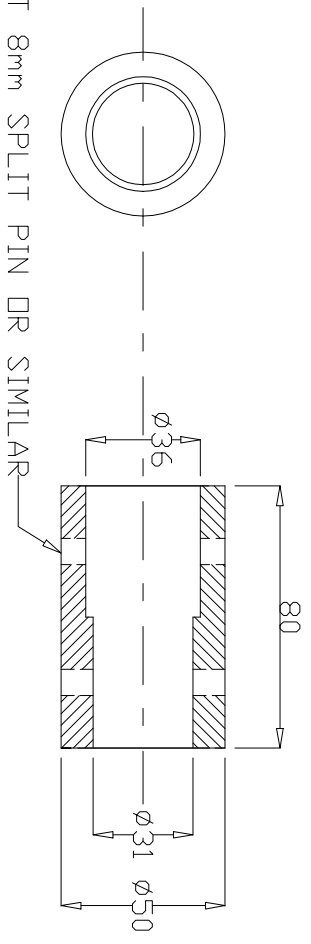
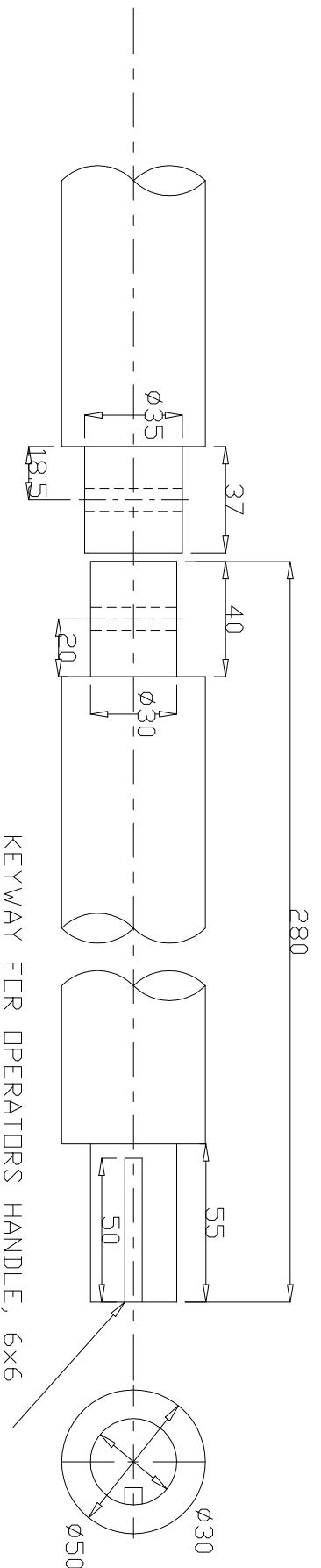
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Date

Signature

Checked

CONNECTING SLEEVE AND EXTENSION SHAFT FOR TEARDROP VALVE



Drawn by: J.O'Nians	Checked by:	Approved by & date:	Filename: ITP-01-0732-X08	Date: 13.12.01	Scale: none
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Teardrop valve shaft & sleeve

DRG NO. ITP-01-0732-X08

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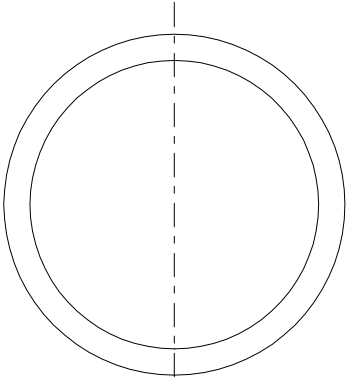
Power Ltd
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 RG24 8AG, UK
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Issue: 1
 Sheet: 1/1

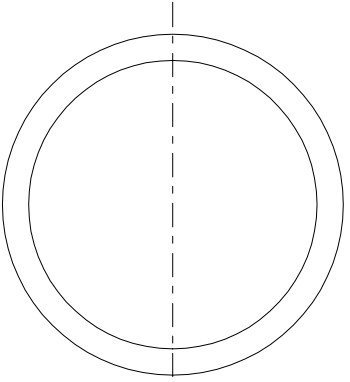
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No.	Revision note	Date	Signature	Checked
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1. SLEEVE FOR RUNNER SHAFT
 GALVANISED STEEL TUBE
 eg. WATER PIPE

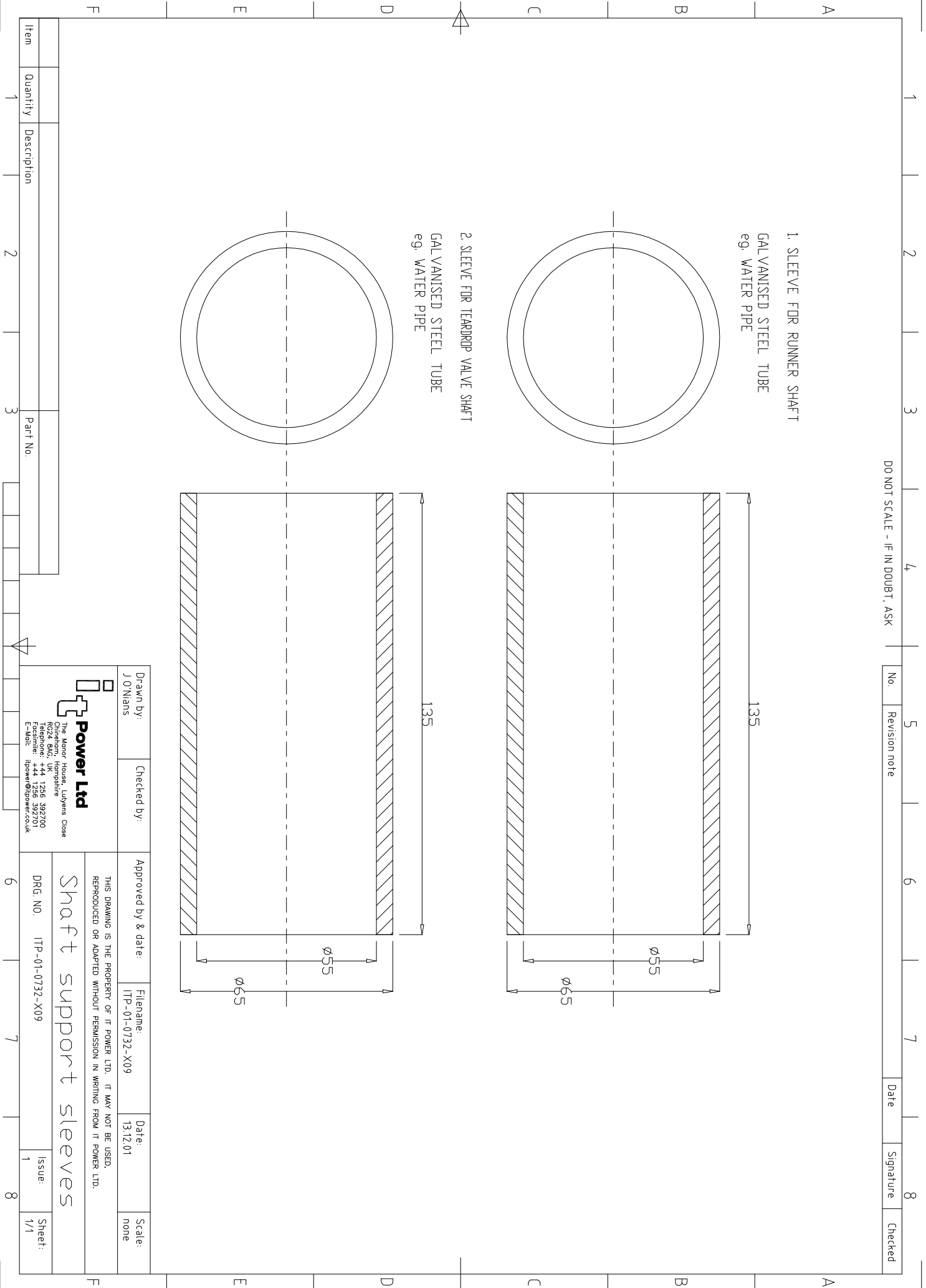


2. SLEEVE FOR TEARDROP VALVE SHAFT
 GALVANISED STEEL TUBE
 eg. WATER PIPE



Item	Quantity	Description	Part No.
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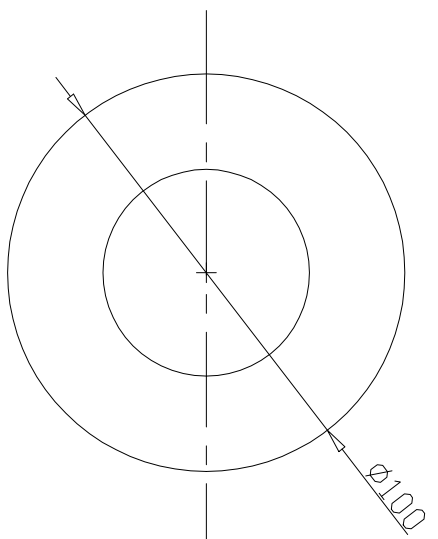
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<h2>Shaft support sleeves</h2>					
DRG. NO. ITP-01-0732-X09				Issue:	Sheet:
				1	1/1



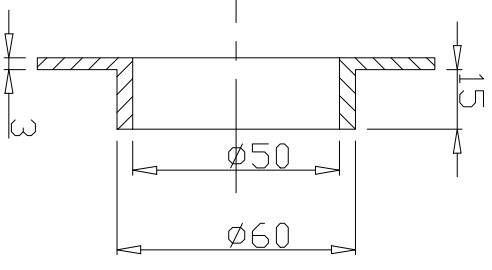
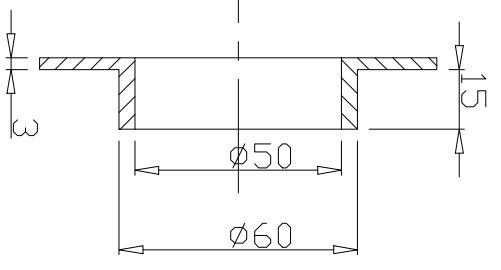
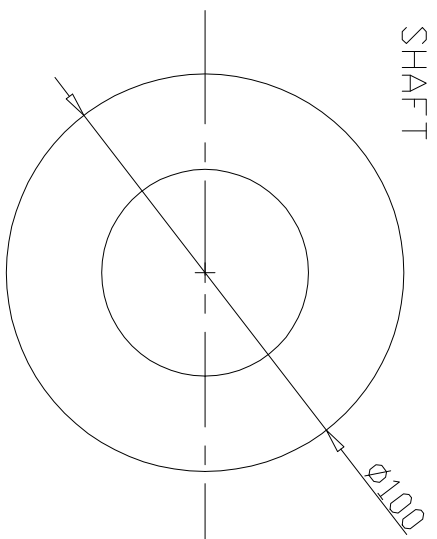
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No.	Revision note	Date	Signature	Checked
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1. FLINGER FOR
RUNNER SHAFT



1. FLINGER FOR
TEADROP VALVE
SHAFT

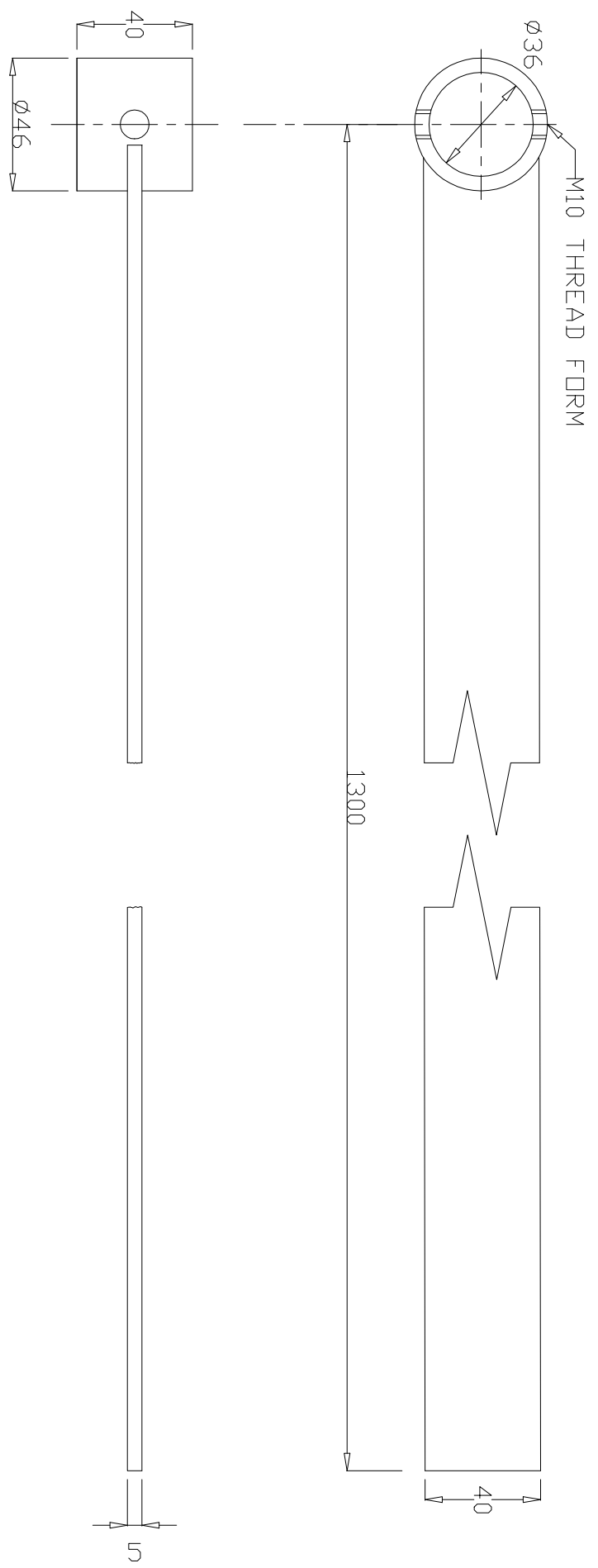


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<p>Shaft flingers</p>					
DRG. NO. ITP-01-0732-X10			Issue:	1	Sheet: 1/1

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No.	Revision note	Date	Signature	Checked
5				



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Tear drop valve adjusting handle

DRG NO: ITP-01-0732-X11 Issue: 1 Sheet: 1/1

Item	Quantity	Description	Part No.						
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 The Manor House, Lulworth Green
 Ower, Hampshire
 RG24 5AG, UK
 Telephone: +44 1256 392700
 Fax: +44 1256 392701
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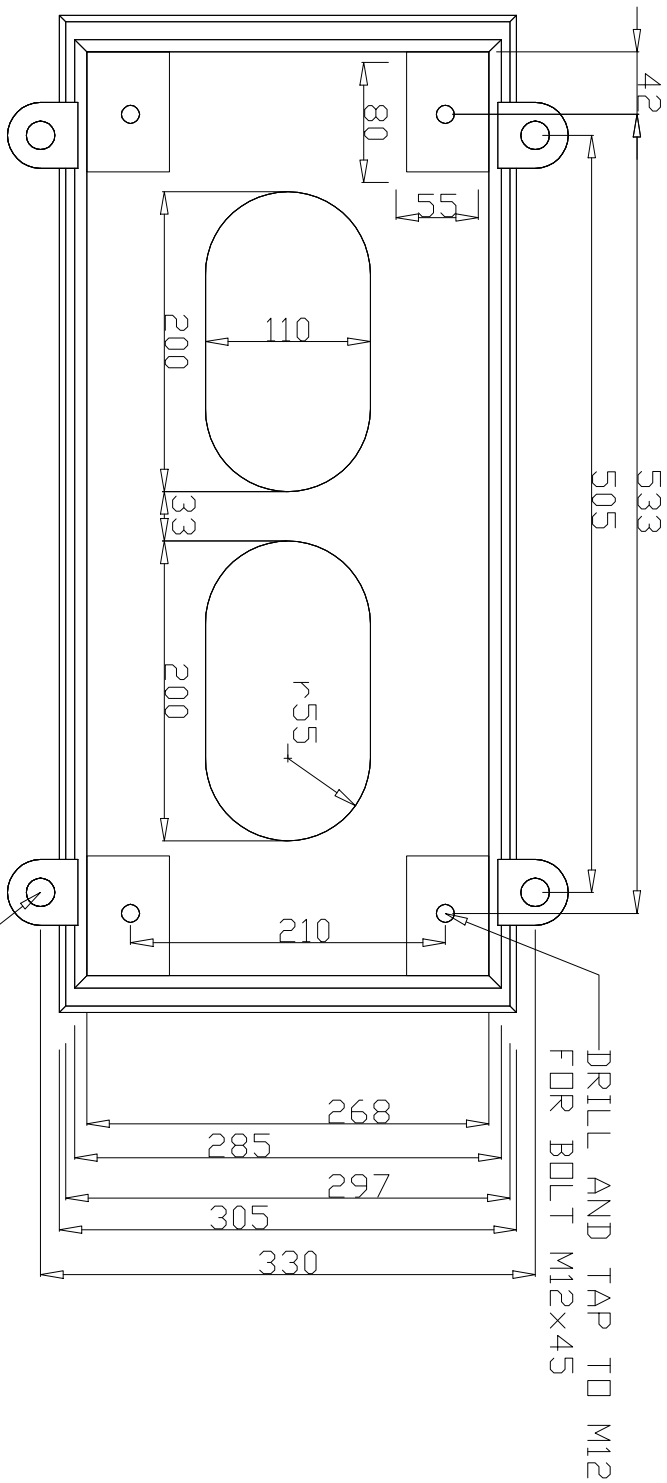
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No. Revision note

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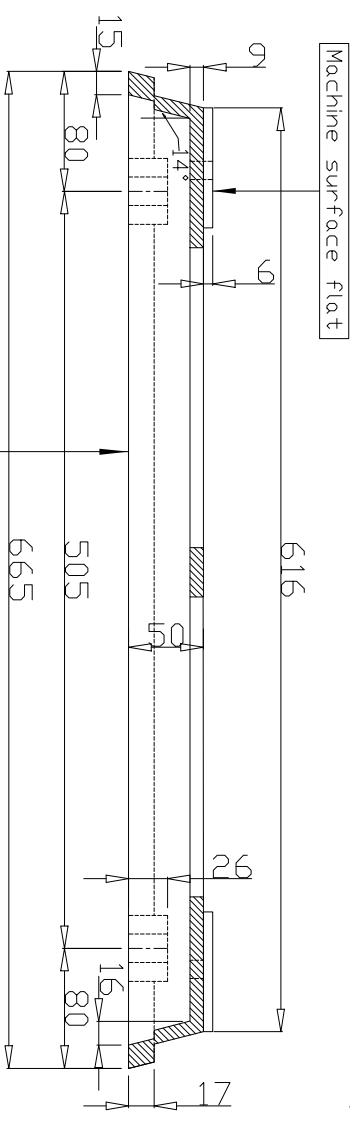
Signature

Checked



BASE PLATE FOR OPEN
CROSS-FLOW TURBINE

Ø19 HOLES FOR FOUNDATION
FOR BOLT M16X450



Machine base surface flat

Drawn by:	Checked by:	Approved by & date:	Filename:	Date:	Scale:
J O'Nians			ITP-01-0732-X12	13.12.01	none

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Baseplate

DRG. NO. ITP-01-0732-X12

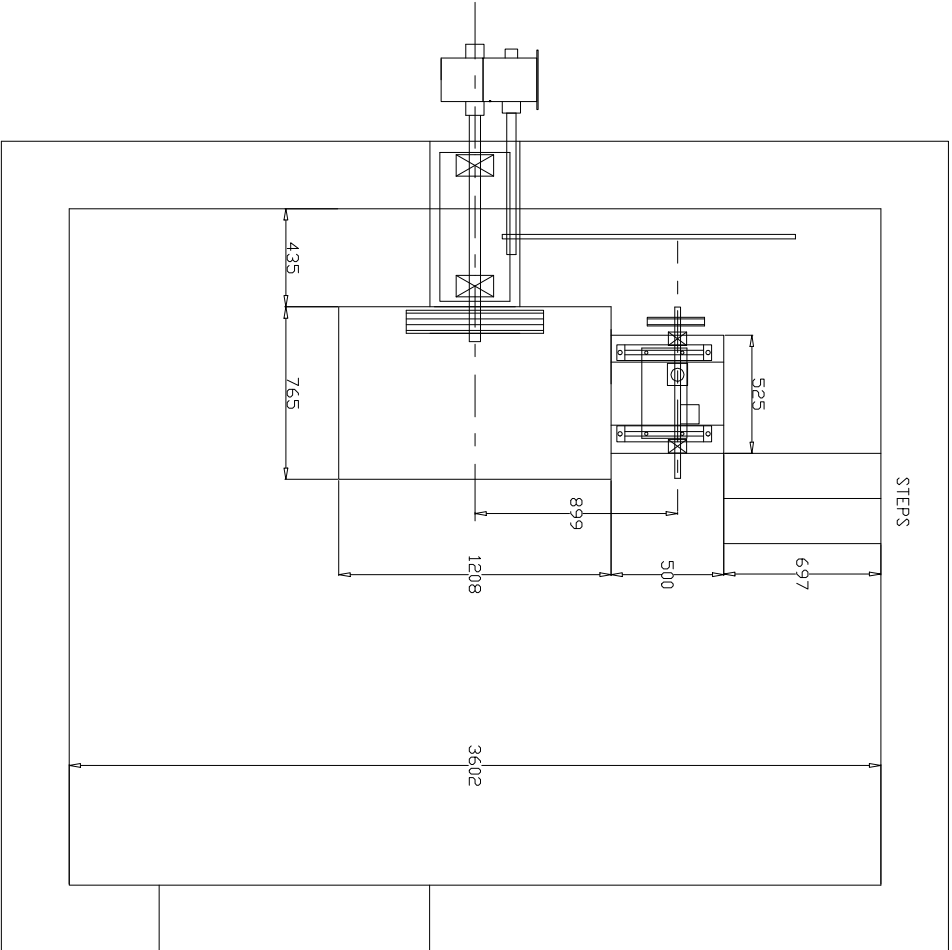
Power Ltd
The Manor House, Ludlans Close
Oxshott, Wokingham, Hampshire
RG24 5AG, UK
Telephone: +44 1256 392700
Facsimile: +44 1256 392200
E-Mail: itpower@power.co.uk

Item	Quantity	Description	Part No.
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Issue:	1
Sheet:	1/1

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PLAN



Item	Quantity	Description	Part No.						
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	3								
	4								
	5								
	6								
	7								
	8								

Drawn by:
J O'Nians

Checked by:

Approved by & date:

Filename:
ITP-01-0732-X13

Date:
13.12.01

Scale:
none

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Crossflow Powerhouse - P

DRG. NO. ITP-01-0732-X13

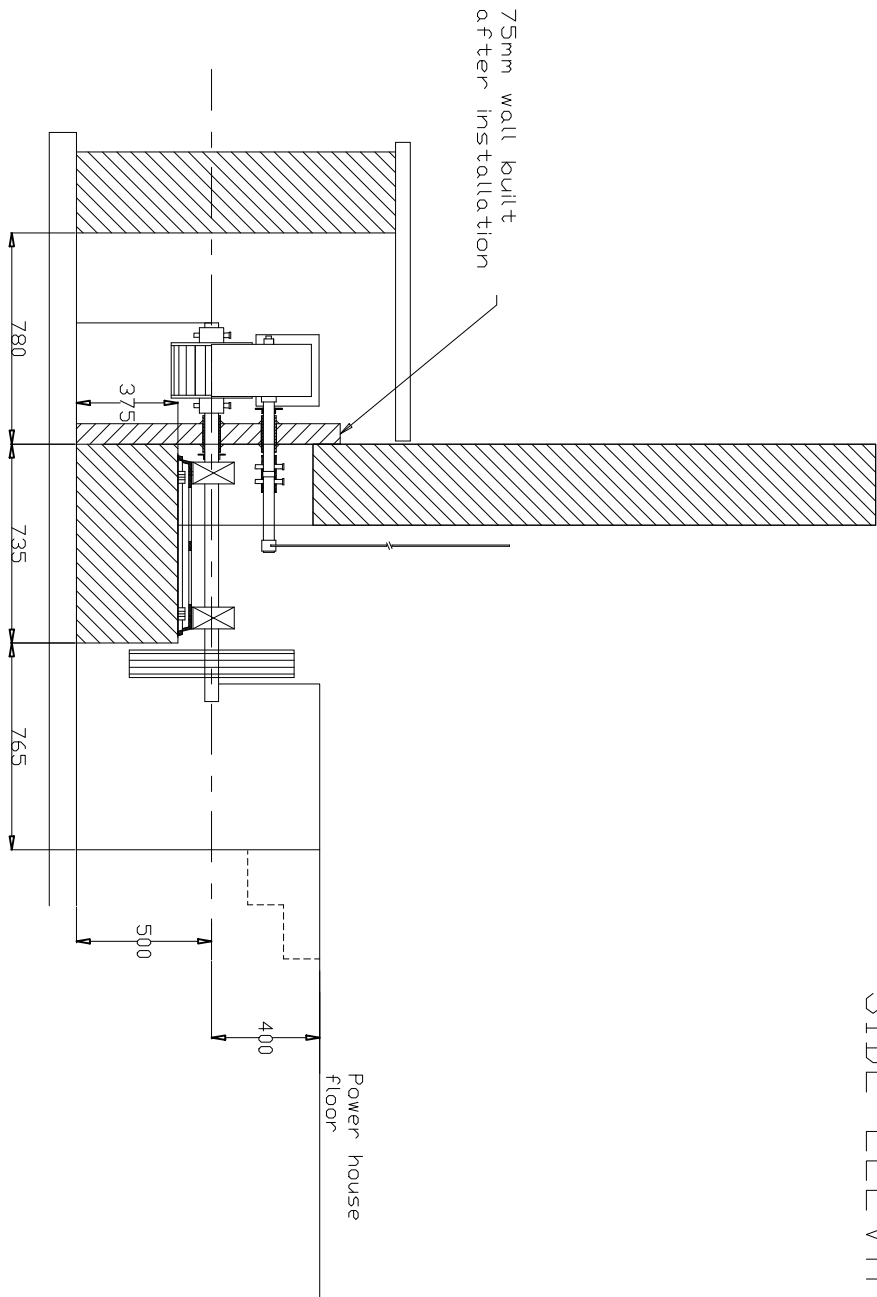
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Sheet:
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Telephone: +44 1256 392700
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SIDE ELEVATION

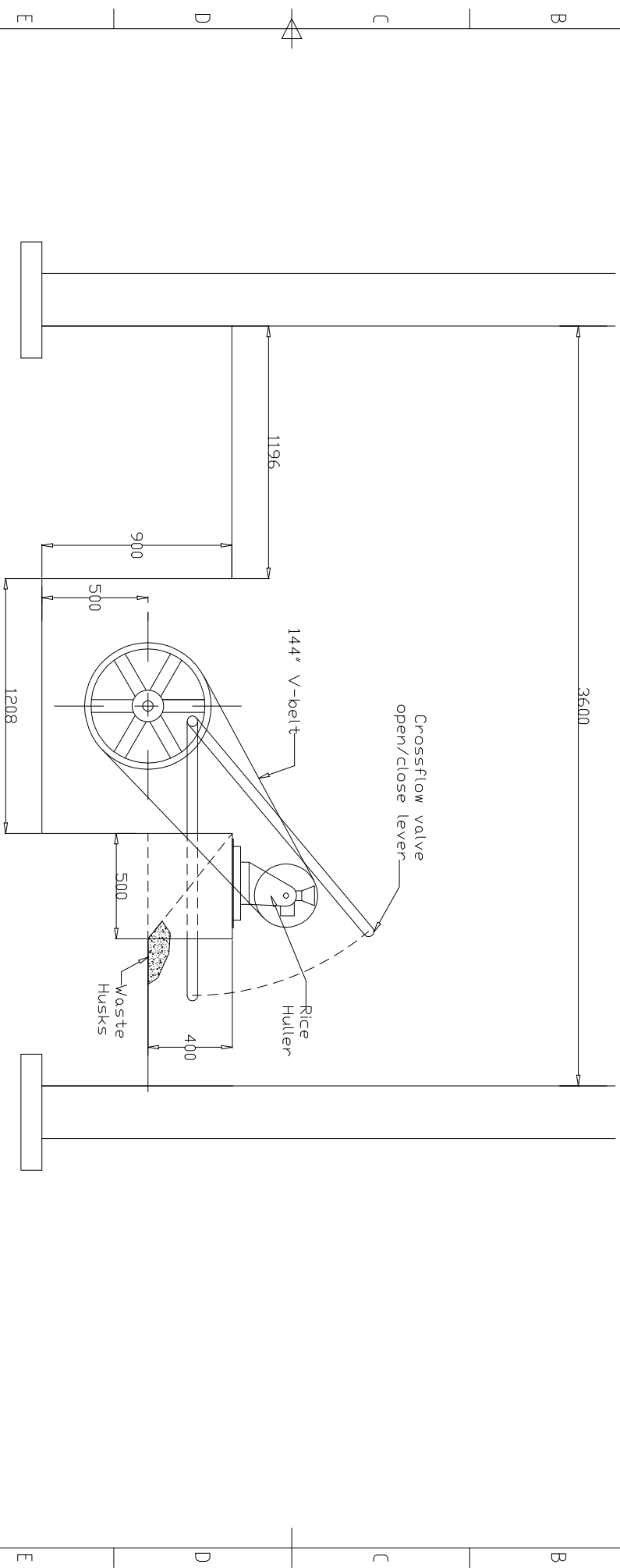


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	8		

Drawn by: J O'Nians	Checked by:	Approved by & date:	Filename: ITP-01-0732-X14	Date: 13.12.01	Scale: none
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DO NOT SCALE - IF IN DOUBT, ASK

INSIDE ELEVATION



Item	Quantity	Description	Part No.
	1		
	2		
	3		
	4		
	5		
	6		
	7		
	8		

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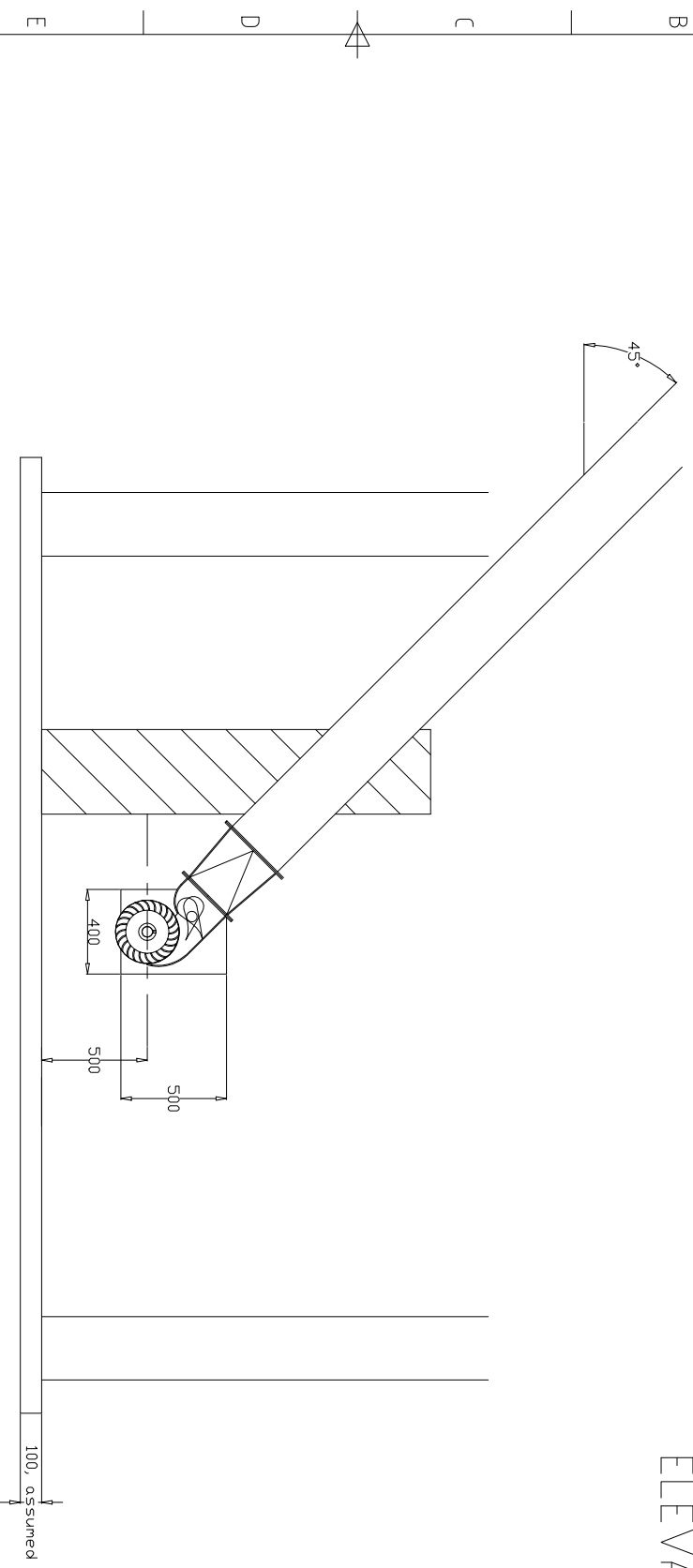
Crossflow Powerhouse - IE

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DO NOT SCALE - IF IN DOUBT, ASK

OUTSIDE ELEVATION



Item	Quantity	Description	Part No.
	1		
	2		
	3		

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