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PROGRAM: PIT-CAEF- 10

CALCOLO PER DISCHI TARATI A SPIGOLO VIVO
CALCULATION FOR SQUARE EDGE ORIFICES

INTERNATIONAL STANDARD ISO 5167 FOGL./SHT.:J-3888/1

COMMESSA/JOB No	:J-3888	DATA/DATE	:10.12.02
CLIENTE/CUSTOMER	:ENELPOWER SPA	ORDINE/ORDER	:I.AA.2.2.167.1
FLUIDO/STREAM	:METANO	SIGLA/TAG	:E-G-44B NQ399X
MODEL	:METER RUN	MATERIAL	:SS316+A106/B
SIZE	:10"300RF	TYPE	:FLANGE TAPS-PRESE SULLE FLANGE

W =PORTATA M/FUL.SC.FLOW	: 65415.1	Kg/hr	84000	Nm3/h	T1=TEMP.MONTE/UPST.TEMP.	: 35	°C	35	°C
Wh=PORT.NORM/NORMAL FLOW	: 52176.33	Kg/hr	67000	Nm3/h	Di=DI.INT.TUB/IN.PIPE DI.	: 253.5	mm.	253.5	mm
P1=PRS.MONTE/UPSTR.PRES.	: 31.624	Kp/cm2A	3000	KPa R	Zf=FAT.COMP/COMPRES.FACT.	: 1		1	
dP=PRES.DIFF./DIFF.PRESS.	: .25	Kp/cm2	2500	mm H2O	Yb=PESO SP.RIF/REF.SPC.WT	: .7788	Kg/m3	0	Kg/m3
Pn=PRS:VALLE/DWNST.PRES.	: 31.374	Kp/cm2A	0	KPa R	Yf=PESO SP.ES./FL.SPEC.WT	: 21.133	Kg/m3	0	Kg/m3
μ =VISCOS.CIN/KIN.VISCOS.	: .473	cStk.	.01	cp	ε =FAT.ESPANSIONE/EXPANS. FACTOR		.9982		
I =ENTALPIA/ENTHALPY	: 0	Kcal/Kg			k =ESPON.ADIAB/ADIAB.EXP.	: 1.4	cp/cv		
Fa=COEF.DIL/DIL.FACT.	: 1.0007				Mw=PESO MOLECOL./MOLECULAR WEIGHT		: 17.46		

$$\alpha\beta^2 = \frac{W}{1.251.Fa.Di^2.\sqrt{dP}.\sqrt{Yf}.\varepsilon} = \frac{65415.1}{1.251 \times 1.0007 \times 64262.25 \times .5 \times 4.5971 \times .9982} = .3544081$$

d	: 180.65	mm	DIAMETRO ORIFIZIO / ORIFICE DIAMETER
β =do/Di	: .712637		RAPPORTO DI STROZZAMEN. / ORIFICE TO PIPE RATIO
α =C.E	: .697863		COEFFICIENTE DI PORTATA / FLOW COEFFICIENT
C	: .6011704		COEFFICIEN. DI EFFLUSSO / COEFFICIENT OF DISCHARGE
E =√(1/(1-β⁴))	: 1.160841		COEF.VELOC.DI APPROCCIO / VELOC.OF APPROACH FACT.
RD=10³.Vp.Di/μ	: 7282557 --		NUMERO DI REYNOLDS NORM./ NORMAL PIPE REYNOLDS No
Vo	: 26.76	m/sec	VELOC.NORM.EFFLUSSO ORIF/ NORM.ORIF.OUTLET VELOC.
Vp	: 13.59	m/sec	VELOCITA'NORM. CONDOTTA / PIPE NORMAL VELOCITY
δP= 47.7 % dP	: .119		Kp/cm2 PERDITA DI CARICO PERMAN/ PERMANENT PRESS.LOSS

0 TRATTO MIN.TUBAZ.DIRITTA MONTE/VALLE MIN.UPSTREAM/DOWNSTREAM STRAIGHT PIPE REQUIRMENT

RACCORDI A MONTE	UPSTREAM FITTINGS	B=	< 0.45	.45 -.55	.55 -.65	.65 -.73	> 0.73
RIDUZIONE < 0.5 Diam.	REDUCER < 0.5 Dia.		A= 6 B=5	A= 8 B=6	A=11 B=7	A=20 B=8	A=30 B=8
VALVOLA TUTTA APERTA	FULLY OPEN VALVE		A=20 B=6	A=23 B=6	A=27 B=7	A=34 B=7	A=40 B=8
1 GOMITO O CURVA	1 ELBOW OR BEND		A=12 B=6	A=16 B=6	A=21 B=7	A=34 B=7	A=42 B=8
2 CURVE STESSO PIANO	2 BENDS SAME PLANE		A=18 B=6	A=21 B=6	A=30 B=7	A=38 B=7	A=45 B=8

L1=A.Di=mm=TRATTO A MONTE/UPSTREAM RUN L2=B.Di=mm=TRATTO A VALLE/DOWNSTREAM RUN

CALCOLO DELL'ERRORE PROBABILE EXPECTED ERROR EVALUATION

SCOSTAM. TIPO : a= σα = ± .71 % b= σDi = ±.5 % c= σd = ± .02 % d= σdP = ±1.00%
STD.DEVIATION : e= σYf= ± 1 % f= σFa = ±.3 % g= β⁴/α = .37 % h= σε = ± .02 %

PER CONDIZIONI ESERCIZIO ENTRO LE TOLLERANZE INDICATE FOR OPERATING CONDITIONS WITHIN INDICATED TOLERANCES

$$\sigma W = \sqrt{a^2+(4.g^2.b^2)+à4(1+g)^2.c^2è+0.25(d^2+e^2)+f^2+h^2é^{1/2}} = \pm 1.11 \ \%$$

Err.% = 2.σW = ± 2.22 % ERRORE PROBABILE / EXPECTED ERROR
Add.Error = ± 0.5 % PER TRATTO DIR.((L1+L2) MA ≥ 0.5(L1+L2) / FOR STRAIGHT RUN < (L1+L2) BUT ≥ .5(L1+L2)

** REYNOLDS No MIN. = 162212.7 ** REYNOLDS No MAX. = 10^8

NOTE